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Journal of the Society of Arts.

FRIDAY, APRIL 16, 1869.

Announcements by the Council.

Ordinary Meetings.

Wednesday Evenings at eight o'clock :—

April 21.—"On Trade Marks." By W. Wybrow Robertson, Esq.

April 28.—"On the Duties of the Architect with reference to the Arrangement and Structure of a Building." By Roger Smith, Esq. On this evening Sir Digby Wyatt will preside.

May 5. "On the Formation of Industrial Settlements in our Colonies." By Col. Francis C. Maude, C.B.

May 12.—"On the Ventilation of Drains." By James Lovegrove, Esq., Assoc. Inst. C.E.

May 19.—"On the Progress of the Colonies." By John Robinson, Esq., of Natal.

May 26.—"On Silk Supply." By Thomas Dickins, Esq., President of the Silk Supply Association.

Cantor Lectures.

A Course of Four Lectures "On Applied Mechanics" is now being delivered by John Anderson, Esq., C.E., Superintendent of Machinery to the War Department, as follows :—

Lecture II.—Monday, April 19th.

Applied Mechanics in relation to Natural Properties of Materials.

Lecture III.—Monday, April 26th.

Applied Mechanics in relation to Natural Laws in processes.

Lecture IV.—Monday, May 3rd.

Applied Mechanics in relation to Natural Power.

Each lecture will begin at eight o'clock. These Lectures are open to Members, each of whom has the privilege of introducing two friends to each lecture. Tickets for this purpose have been forwarded to each Member.

Committee on India.

Six Conferences are now in course of being held for the discussion of the following subjects, viz. :—

Tea Cultivation in India.
Hill Settlements and Sanitaria.
Waste Lands in India.
Trade with Central Asia, Thibet, and South-Western China.
Indian Fibres.
Silk Cultivation and Supply.

The following evenings have been fixed for the remaining four conferences :—

Friday, April 16th.
" April 30th.
" May 14th.
" May 28th.

At these Meetings the chair will be taken at 8 o'clock, and the discussion will be opened by a paper.

This evening, Friday, the 16th inst., a paper, "On Hill Settlements and Sanitaria," will be read by Mr. Hyde Clarke, Member of the Council. The chair will be taken by Lord William Hay.

Members of the Society interested in Indian questions are invited to attend.

Artistic Copyright.

The Bill for Consolidating and Amending the Law of Copyright in Works of Fine Art, which has been prepared under the direction of the Society's Committee, has been presented to, and read a first time in, the House of Lords. The second reading of the Bill is fixed for Tuesday next, the 20th instant, when Lord Westbury, who has kindly taken charge of the Bill, will bring the subject fully before the House.

Postage of Printed Matter and Parcels.

The Council have appointed a Committee to promote the adoption of reduced rates of postage, particularly in reference to printed matter and parcels.

Subscriptions.

The Lady-day subscriptions are due, and should be forwarded by cheque or Post-office order, crossed "Coutts and Co.," and made payable to Mr. Samuel Thomas Davenport, Financial Officer.

Proceedings of the Society.

Food Committee.

The Committee met on Wednesday, 17th March; present—Mr. Seymour Teulon, in the chair; Messrs. J. T. Ware, James A. Youl, and John Jenkins.

Mr. Joseph Mitchell, C.E., of Inverness, and Wimpole-street, attended to give information to the Committee with respect to the supply and transport of fish from the north of Scotland.

Mr. Mitchell said he had, for forty-two years, charge of the roads, bridges, and harbours under government in the seven northern counties. He was also twenty-two years engineer to the Commissioners of the Herring Fisheries, for building fishing harbours, and consequently was well acquainted with the whole coasts of Scotland and the Hebrides. For the last fifteen years he had been engaged in constructing 280 miles of railway north of Perth, viz., the Central or Great Highland Railway, and the line bordering on the Moray Firth, from Keith along the shore to Golspie, in Sutherlandshire, and his attention was of late more especially directed to the fisheries, from wishing to promote the traffic of the railways he had constructed. The traffic by these railways would come into England from Perth by two routes; the east coast route by Edinburgh and Berwick; and the west coast route by Carlisle. In the summer of last year he drew the attention of the directors of the Highland

Railway to the importance of the fish traffic as a source of revenue, and pointed out that the Moray Firth teems at all times with cod, turbot, haddock, flounders, and skate, and the shoals of herrings surpass anything on the coasts of Great Britain. The fishery was private enterprise entirely. Before the railways were made, the only way of realising this harvest of fish was by curing. Cod and ling were pickled and dried, and forwarded to the southern markets. The herrings were cured and sent abroad, chiefly to the Baltic and Spain, and some to London, and of late years a very considerable trade has arisen in the curing (smoking) of haddocks for the London market, &c., but as yet only a very small portion of fish in the Moray Firth is sent south in a fresh state. Now that there are railways, he thought the fish might be sent south fresh, and thus realise a better price, and be of great value to the masses of the population in London and the southern cities. By the returns recorded in the report of the Fisheries Commissioners, there were caught in 1867, along the coast of the Moray Firth from Peterhead, and along the eastern shores of the counties of Ross, Sutherland, and Caithness, including the Orkneys, 348,748 crans, of which 216,000 were caught along parts of the Moray Firth which have access more or less convenient to the Highland Railway. There are, therefore, about 36,000 tons of herrings caught, and it is estimated some 16,000 or 17,000 tons of other fish, making from 50,000 to 60,000 tons of fish annually caught in this locality, and very little of this, as yet, was sent south fresh. A cran or barrel consists of 700 herrings, making the total number of herrings caught in this district about 244,125,600. The catch of fish seems inexhaustible along the coasts of Scotland; the quantity appears progressive, for, according to the Fishing Board reports, the average cure for eleven years to 1820 was 183,980 crans or barrels.

	Barrels.
For 10 years to April, 1830..........	350,049
„ „ 1840..........	445,057
„ „ 1850..........	615,722

For the ten years from 5th January, 1850, for Scotland and the Isle of Man (the collection for England having ceased at that date), the total cure was 613,654. For six years to 1st December, 1865, the cure was, for Scotland and the Isle of Man only, 683,526 barrels. In 1865 alone, the cure was 621,763 barrels; in 1866, 658 146; and in 1867, 825,589 barrels. These were the total quantities of herrings cured, as reported by the Commissioners, all over the Scotch coast, but the chief quantity was caught in the Moray Firth; and he gave these figures to illustrate the progressive increase in the catch of fish, showing that if the fishing is properly prosecuted the supply seemed to be inexhaustible. He knew that was disputed by some persons, but these figures were the actual returns from the Fisheries Reports. Now fresh fish in London was in a great measure the food of the rich, and that was plainly seen by the very small number of fresh fish shops met with. In all Mayfair there were not above six or eight, and fish at the West-end was sold at the following prices:—Cod, 9s. 6d. to 14s.; shoulders, 4s. to 12s. 6d.; slices of crimped cod, 1s. 6d. to 3s. 6d.; haddocks, 1s. 6d. to 2s. 6d.; crimped skate, 1s. per lb. The prices in the Moray Firth were:—Cod of the best quality, 6d. to 8d., each weighing 10 to 16 lbs.; haddocks purchased over head 1d. to 2d. each, varying from ¾ lb. to 1 and 2 lbs. weight; herrings, 20s. to 25s. per barrel, which, at the average price in the London fish ships of 2s. per dozen, would be £5 16s. 8d. per barrel. The prices in London were taken from the daily list of a West-end fishmonger, and were quoted to show the difference. He saw no reason why a large supply of the fish caught in the Moray Firth might not now be supplied to London, and the other great English towns. At this moment a train leaves Forres, a central point on the Moray coast, at 1.50 p.m., on the arrival of the train from Golspie, Inverness, and the north, and from Tossiemouth, Buryhead, &c., on the east, which could take all the fish caught, and to be sent that morning. This train reaches London at 9·40. a.m., 19½ hours from Forres; and, of course, it would arrive some hours earlier at the towns north of London. For that matter the train could be increased in speed 1½ to 2 hours. Then, again, fish caught in the morning at the outports, such as Helmsdale and Wick, and along the Caithness coast, could be brought to the rail by six in the morning, and might be despatched then, and arrive at most of the English towns about midday. Now (continued Mr. Mitchell), the question arises, how does it happen that, with prices so low in the Moray Firth, and so high in London, and the time of transport from the sea to London less than 24 hours, and at the present time not more than from Ireland, Cornwall, and even Scarborough, we do not send fresh fish from the Moray Firth. He was answered by the railway manager, that they carried all that came to them, and that it was not his business to turn fish merchant; and no doubt that was true. He was answered by fish curers that they knew their business *better than* he did; that often they had sent fish to London, and if it did not arrive by early morning it was put aside till next day, and so often sold at a loss. He reminded the railway manager that he had got a new instrument for the transportation of fish, and that it was his duty, if he wished quickly to secure the traffic, to make arrangements accordingly; that the able manager of the Great Northern Railway, some 12 years ago, saw that London was supplied with coals solely by sea from Newcastle and Durham, and that he contrived to take coal from the South Yorkshire coal-fields, and even from Durham, at ⅜th's of a penny per ton per mile; but this was not done without a severe struggle, for the coal-merchants would not go out of their beaten track, whereupon he appointed clerks to take orders all over London. The result was the coal trade on the Great Northern gradually increased, so that, in 1867, that line carried 1,040,000 tons of coal to the metropolis. The other railway companies followed his example, and he (Mr. Mitchell) believed London was now half supplied with coals by railway, at from 18s. to 25s. per ton, some 20 or 30 per cent. lower than before. He saw no reason why similar efforts might not be equally successful in regard to fresh fish. Herrings are cured in the north to the extent of, as he had said, many hundreds of thousands of barrels. Now, the barrel and curing cost 7s. 6d., a sum which would go far to pay the transport. There could be no doubt in his opinion that it would immensely benefit all parties if this fish could be brought fresh to London; but it was clear it could not go to Billingsgate. The wholesale salesmen and fishmongers appear, like the coal merchants, to be against any change. In his opinion, the demand for fish in London was inexhaustible if people were sure of getting the article. Why should not the northern fish merchants have agents in London, who could meet the trains and take the fish at once within the reach of the consumers. It should be the business of the London agent to secure buyers. The whole should be done, and with the aid of the telegraph ought to be done, so as to be as certain of the market and consumption as they were certain of the arrival of the railway trains. Of course, unless this was arranged beforehand, a great supply would be a failure. He thought the sales at Billingsgate, if Billingsgate is continued, should be confined to the fish brought by the river; and as to the fish brought by rail, the supply for twenty-four hours could easily be known six or seven hours before by telegraph; and Smithfield might be available for the concentration of the traffic and sale of fish as well as meat. Nothing could be more absurd than all the fish arriving at Paddington, going down by cart to Billingsgate, five or six miles, and the greater part being recarted four or five miles to the West-end again. This carting he had no doubt was more detrimental to the quality of the fish than all the railway journey; and then, if it did not arrive by five in the morning, forsooth it could not reach the customer till next day. One of the fishmongers stated that every hour the fish is out of the consumers' hands it deteriorates. Mr. Mitchell remarked that London contained upwards of 3,000,000 of inhabitants, and covers an area of 118 square miles. Fish, of all articles of food, from its perishable nature, requires to be distributed over this area in the promptest manner, yet, at present, the whole supplies of London, besides the surrounding country, have to be concentrated at Billingsgate. He considered that, however convenient Billingsgate may have been before the period of the railways, it is not so now, for he believed at the present time two-thirds to three-fourths of the fish supply of London comes by railway, and, when there is a large supply, the passage to Billingsgate is blocked up for hours. Look at the mode in which fish is distributed at the present time. Trains arrive with fish from Ireland, Milford Haven, Cornwall, and Scotland, and are taken from the railway stations by carts to Billingsgate, in some cases a distance, as I have said, of six miles, and then redistributed in carts all over the metropolis, six, eight, and ten miles. Surely the fish supply of 3,000,000 of people might afford profitable employment, not for one, but for three central markets. If you ask any of the fishmongers about this, they will tell you that more than one market will never answer, and that that market is Billingsgate. Well, the fishmongers are a most respectable class of men, and we are entitled to give weight to their opinions, guided by their personal interests and practical experience; but, in my view, Billingsgate should now be confined to the sale of fish coming up the river, if retained at all. I fear matters will never alter, nor will fish become the food of the people, instead of being, as at present, almost exclusively the food of the rich, unless some public authority, in combination with the railway companies, will do as Mr. Seymour Clarke did in the coal trade, appoint agents all over London, irrespective of Billingsgate, for the immediate sale and distribution of fish as it arrives. Now, as to the time that fish will keep good, he had very good authority on that point. He consulted Mr. Anderson, an eminent and wealthy fishmonger in Edinburgh, who confirmed his (Mr. Mitchell's) views, that fresh fish may be sent from Moray Firth with great advantage. Cod, haddock, and ling, by drawing the stomach, will keep, according to Mr. Anderson, for forty-eight hours, and in winter, for four days. He recommended that they should be sent in boxes two and a-half feet broad, eight inches deep, and three feet long, with rope handles, and a few pieces of ice to fill up corners were a great advantage; and in the north ice could easily be got in any quantity with a little forethought. In fact, Mr. Mitchell thought that it only required arrangement and organisation to add the great fishing of the Moray Firth to the fish supply of the other parts of the coasts of Great Britain. Indeed, fish from the Moray Firth may reach London, by even the present transit, as quickly as fish is now supplied from Ireland, Cornwall, and even from Scarborough. He had gone to Scarborough and to Liverpool, and corresponded with persons who were conversant with the transport of fresh fish from these distant localities, and the above was the result.

The Chairman remarked that one of the difficulties which was not easily to be got over was, if there were only one or two kinds of fish brought to a particular part, the dealers in fish who want a variety would not go to an isolated place for their supply. If the fish could be altogether brought by railway to a central spot such as Smithfield, he could imagine such a thing would work. With regard to the particular fish brought from the Moray Firth, such as cod and ling, it would be better for being kept a little time.

Mr. Mitchell—The Moray Firth and the Scotch coast had fish of every description except soles. Cod was, no doubt, better from being a day in salt.

The Chairman added, the great question was the distribution. They could hardly get people in the trade to alter their mode of getting supplies.

Mr. Mitchell observed that no doubt was the difficulty. His object was to make it clear that fresh fish could be sent in good condition from the Moray Firth to London; but he admitted the difficulty was how to get it distributed amongst the consumers, and yet the inhabitants of London would only be too thankful to take it. It was monstrous that the shores of Great Britain should teem with fish, particularly the Scottish shores, with ready means of transit, yet he believed three-fourths of the inhabitants of London never taste fresh fish. As he said, it was a luxury, the food of the rich.

The Chairman—The railway companies would require to be shown that it was their interest to encourage and facilitate this fish traffic, and they might have carriages constructed for the purpose of keeping the fish as cool as possible during the transit.

Mr. Mitchell said he had done his best in the north to draw the attention of the railway *authorities to this* subject, and since he had been staying in London he caused to be sent to him, by way of experiment, a cwt. of cod, ling, and haddocks; they arrived in excellent condition. The fish of each kind were large. He was charged in the Moray Firth, for the haddocks, 3d. each, for the cod, 1s. 6d. each. Now the price list sent to his house by the fishmonger on the 23rd of February was, haddocks, 1s. 6d. to 2s. each; Dublin Bay haddocks (and they are not much nearer London than the Moray Firth) were quoted at 2s. to 2s. 6d. each; cod-fish, 6s. 6d. to 15s.; crimped haddocks, from 7s. 6d. to 16s. 6d. each; crimped slice of cod, 1s. 6d. to 3s. 6d.; fresh herrings, 2s. per dozen.

The Chairman asked Mr. Mitchell whether he was prepared with any propositions for getting over the difficulties suggested. Mr. Mitchell had suggested some arrangement with regard to Smithfield market. He (the Chairman) understood the Corporation contemplated some alterations with respect to that market, and the fact that the great bulk of fish taken to Billingsgate was now brought by the railways instead of by water, might have some effect with regard to Billingsgate itself. Therefore any information with regard to fresh sources of supply of fish was important, as assisting the authorities to determine upon the future site of the central fish market, in the event of the removal of the present one.

Mr. Youl remarked it was important that fish should arrive in London very early in the morning; if not the fishmongers would not distribute it. In order to enable the fish to arrive in time for the market, it would involve a great alteration in the trains coming from the north. Under the present arrangements it would seem the fish from the Moray Firth would not reach London till eight or nine o'clock, when the market for the day was over.

Mr. Mitchell thought the interests of the public were more important than the convenience of the fishmongers, and they deserved consideration. Although fish did not arrive in London before eight or nine o'clock a.m., or even ten oclock, he saw no reason why it should not be distributed for dinner that day; besides, there was a large trade in fish from the Firth of Forth, which, for that matter, could arrive at any time in the morning. Mr. Mitchell's attention was first drawn *to this subject* by noticing that the moment the railway was open from Edinburgh by Berwick, and a new harbour at Dunbar, the great bulk of herrings caught in the Firth of Forth were sent south fresh in barrels and boxes, and more than double price was obtained for them, and the quantity sent was increasing every year.

Mr. Jenkins asked whether there was not a large supply of fish from Hull to the Midland counties.

Mr. Mitchell—From Hull, and also from Scarborough. The Scotch train came up in the evening from Scotland to York, and met the Scarborough train there, and at that place the train was marshalled to the different towns where the market was best for fish. It was delivered at Derby, Leicester, Leeds, Birmingham, and other towns. In fact, the London market was not reckoned by the fish curers in the north so good a market as the towns in the Midland counties.

Mr. Jenkins asked whether Hull was not a large depôt for the landing of fish from the German Ocean, and whether fish from that place would not reach the Midland counties at early morning?

Mr. Mitchell replied no doubt Hull would be the most central port, but he could not see any actual necessity for the London fish market being held so early as five o'clock in the morning.

The Chairman apprehended it was necessary to enable the dealers to distribute the fish over London.

Mr. Mitchell said, as far as he could gather, Billingsgate was at the present time one of the most inconvenient places in London for a market. It took four or five hours to bring fish from the Nore by the river, and it could come from Hull in that time. As regards the delivery of fish by railway, to which he understood some of the fish dealers objected as irregular, he saw no reason why there should be irregularity with regard to the arrival of fish trains any more than with other trains. If fish waggons were attached to the passenger trains they would come as regularly as any trains in the country. There was a fresh meat train started regularly every day from Forres, and it reached London in 36 hours. The meat trains kept time as regularly as the passenger trains, and it ought to be the same with fish.

Mr. Youl thought the great evil at present was the length of time that the fish were now detained in the streets leading to Billingsgate before they could be unloaded in the market.

Mr Jenkins inquired whether Mr. Mitchell calculated upon a new trade in fish, to the amount of 50 tons a day, having to contend with an already established trade?

Mr. Mitchell had no doubt the difference of price obtained would induce a great trade from the north of Scotland in the herring season. There would be a great difference in the returns to the dealers if the fish could be sent south in a fresh instead of in a cured state; the cost of curing would be saved, and the returns on their capital would be immediate.

Mr. Jenkins asked whether the rule did not always apply that there was a great difference at the fishing station and at the market some long distance off? For instance, herrings sold for £1 a thousand at the station would be sold for £3 per thousand 170 miles off.

Mr. Mitchell replied that was probably so.

Mr. Jenkins—And that the perishable nature of fish was an element in the amount of profit which the dealers required in transporting fish from one place to another?

Mr. Mitchell had no doubt it was so, according to present arrangements; but what he thought most to be considered was the public advantage and convenience, and not that of the fishmonger. He thought, by proper organisation for the prompt delivery of the fish, it could be brought to the consumer in better condition, and the area of consumption being enlarged, even if the price of the fish were less, the profit to the dealer would be more certain and greater from the increased quantity sold. But all this required a different mode of dealing from the present. In the herring season in Inverness, the whole community seemed to eat fish, and the odour of fish-cooking pervaded the town as one walked about, such was the superabundant supply of herrings, which were sold at a very cheap rate. The only other mode of disposing of them was by curing, and, as he had already stated that the barrels and packing cost 7s. 6d. each, when they were sent to the Baltic and other places abroad it was a long time before the curers got a return for their capital.

Mr. Jenkins remarked that large quantities of herrings were received in this country from Howth, on the coast of Ireland, and he begged to ask Mr. Mitchell whether he did not think the fishers of Howth, who had no established trade for their herrings, could send over their produce at a cheaper rate than the Scotch dealers, who had already an established trade on the Continent and elsewhere?

Mr. Mitchell replied they could not come quicker than from Scotland. The Scotch dealers would get better prices for the fish if they sent it fresh. The fish which cost, in the Moray Firth, 25s. per cran, sometimes realised as much as 80s. or 90s. in the south. Even from the Hebrides, last spring, as many as 15,000 barrels were sent off, some in quick steamers to Liverpool, slightly strewed over with salt. When landed they were distributed to London and through the Midland districts. What was required, as he had already said, was an organisation of the traffic, and for the distribution of the fish when it arrived; the latter, no doubt, was the more important point. He thought there would be a difficulty in getting the fish into London so early as five in the morning from the Moray Firth. It would take from 12 at noon on the Monday till eight or nine on the Tuesday morning to bring the fish into the London terminus. He saw no reason why the wholesale fish market should not be held at nine o'clock as well as at five o'clock in the morning, as the dealers would then have ample time for the distribution of the fish from all quarters. It only required the alteration of existing habits, and he believed no one would suffer from it.

Mr. Youl remarked that the meat market was held at an equally early hour of the morning, which he apprehended was necessary for the requirements of the trade.

Mr. Mitchell questioned whether there was any absolute necessity for it. He added that the railway was now being extended from the Highland line at Dingwall to the West Sea, opposite the Island of Skye, and would be a direct communication from the whole Hebrides, and thus would lead to further large supplies of fish, available for the southern markets in a fresh state.

The Committee having thanked Mr. Mitchell for the information he had given them, then adjourned.

Thames Embankment Committee.

The fourth meeting of the committee took place on Thursday, the 8th inst., at 11 a.m. Present—Earl Grosvenor, M.P., in the chair; Lord Elcho, M.P.; Sir Charles Trevelyan, K.C.B.; Col. Scott, R.E.; Messrs. Westmacott, R.A., G. E. Street, A.R.A., Baillie Cochrane, Hyde Clarke, Edwin W. Field, Seymour Teulon, and C. F. Hayward.

After some preliminary discussion whether or not it was advisable that the Committee should come to a definite resolution with regard to the proposal to place the Law-courts on the Thames Embankment, the following resolution, proposed by Mr. Edwin Field and seconded by Mr. Seymour Teulon, was agreed to:—

"Resolved—That the Committee report as follows:—

"At their meeting of the 16th March they passed the following resolution:—

"'That it is the opinion of the Committee that public or quasi-public buildings only should be erected on the Thames Embankment; that the designs for such buildings should be publicly exhibited, and approved by an authority responsible to Parliament; and that if any private rights existing before the Embankment was formed or created by it should be found to interfere with the proper execution of such buildings, Parliament should be asked to deal with such rights.'

"The question of building the Courts and Offices of Law has been discussed before this Committee; the report of the discussion appears in the *Journal* of the Society, and the Committee think it better to confine their report on that part of the subject to calling the attention of the Society to that discussion."

The following resolution was proposed by Mr. **Street**, seconded by Sir **Charles Trevelyan**, and passed :—

"That in the opinion of this Committee the authorised position of the railway station on the Embankment in front of Norfolk, Arundel, and Surrey streets, would make the erection of a grand public building on this part of the Embankment very difficult if not impossible."

Lord Elcho said there were two evils connected with railway stations of this kind; one was their position, and the other, not less important, was their character. It had been stated by Sir John Thwaites, before the Parliamentary Committee, that no one had any control whatever over the erection of these stations. It appeared to him that such a station would really be less objectionable if incorporated with any public building which might be put there, than occupying an independent position in front of the Temple-gardens.

Mr. **Street** did not think it possible that a railway station could be satisfactorily connected with any public building, on account of the inevitable noise and smell.

Mr. **Hayward** said there were difficulties connected with the railway itself, as well as the station.

It was moved by Mr. **Seymour Teulon**, seconded by Sir **Charles Trevelyan**, and passed—

"That in reference to the Bill now before Parliament for extending the powers of the Metropolitan District Railway Company, a petition embodying the foregoing resolution be prepared for presentation to the Legislature on behalf of the Committee."

It was moved by Sir **Charles Trevelyan**, seconded by Lord **Elcho**, and passed—

"That it be recommended to the Council to send copies of the report of the discussion on the Law Courts question to the members of both Houses of Parliament, and others interested in the subject."

Mr. **Seymour Teulon** wished to correct a statement of his at the meeting of March 16th, which had been incorrectly reported. At page 316 of the Society's *Journal*, he was represented as saying that, if Mr. Sheilds' scheme for a new street from Piccadilly to Paternoster-row were carried out, the new Record Office in Fetter-lane would have to come down. What he said was, that the Record Office was built so as to line with such a street, in accordance with the plan proposed many years ago, but that no further steps had been taken.

The Committee adjourned to Tuesday, the 13th inst.

Musical Education Committee.

The Committee met on Thursday, the 8th instant. Present—Mr. H. Cole, C.B., in the chair; Right Hon. Sir John Pakington, Bart.; Sir J. Harington, Bart.; Lord Gerald Fitzgerald; Capt. Donnelly, R.E.; Lieut.-Col. Scott, R.E.; Messrs. J. Puttick and R. K. Bowley.

The Committee discussed the propriety of petitioning Parliament to take the necessary measures for affording Musical Education to all classes of Her Majesty's subjects in the United Kingdom, not less complete and efficient than is afforded by France, Germany, Italy, and other countries of Europe; and they drew up a petition, which they recommended should be adopted by the Council for presentation under the corporate seal of the Society.

Piscicultural Committee.

A meeting of the Committee was held on Friday evening, April 9th. Present—Mr. James A. Youl in the chair; Captain Grant, Messrs. G. F. Wilson, F.R.S., Frank Buckland, Spencer Walpole, F. Chadwick, E. N. Lindon, George Campbell, F. T. Porter, George Ledger, and H. F. Ffennell.

The following paper was read :—

SALMON LAWS AND SALMON RIVERS.

By Dr. W. Peard, of Bath.

A large and influential deputation recently waited upon the Home-Secretary, with the purpose of representing the necessity which existed for amending our Salmon-fishery Laws. The deputation was received by Mr. Knatchbull-Hugessen, Under-Secretary of State, who observed "That the Government had the matter under consideration, and that he had no doubt in good time a bill would be prepared on the subject." Ample materials for the construction of such a bill as would really amend our salmon fisheries are already collected; in fact, the vessel is on the stocks, and within the next few months will doubtless be launched on the stormy waters of St. Stephens. Few measures during the present session will probably exercise a larger influence for good or evil than the bill to which Mr. Knatchbull-Hugessen referred. Its scope is far beyond a mere question of vested rights or conflicting interests. It touches our pockets, health, and comfort; and for the time, at least, will determine whether our inland waters are, or are not to remain comparatively barren, and therefore comparatively useless to the community.

The enactments of 1861 and 1865 practically constitute our entire fishery laws; and for a season or two after the passing of the first mentioned Act great things were expected from it. More extended experience, however, has proved that existing legislation is not only inadequate to develop our fisheries, but is actually powerless to prevent their decline. Salmon are as scarce and dear as ever; few rivers have improved, whilst some—we will only instance the Wye and the Tyne—have woefully degenerated.

The Acts referred to will probably be repealed by the forthcoming bill. Instead, therefore, of discussing clauses which may so soon cease to be law, we will endeavour to consider briefly and clearly the conditions held by all authorities as absolutely essential to the well-being of a salmon fishery. This plan will not only show the general reader the points which should hold prominent place in the new bill, but will in some measure enable him to help forward the science of pisciculture, which, when carried out in its entirety, will indeed prove a boon to the age in which we live.

Before proceeding, however, with the subject, if we describe a "perfect" salmon river, and point out the value of a single well-managed fishery, the importance of water culture, and the need which exists for strong and fostering legislation in its behalf, may become more apparent. Let us endeavour to paint such an aqueous Eutopia. Imagine a stream—whose course we will assume to be fifty miles—without any impediment sufficient to prevent our passengers traversing that high road at will; believe the upper tributaries safe and improved; the deeps secure, the shallows fertile. Suppose its waters unpolluted to any injurious extent from the source to the sea; that wise conservators enact judicious bye-laws, erect nurseries, and hatch artificially, whilst honest water-bailiffs protect the property, proud of a stock so ample, as to occupy without overcrowding all the spawning beds; and, lastly, let us conceive that the number of salmon captured in the season is on a par with the annual produce of the spawners. Without taking into account the results which might fairly be expected from a large application of the artificial system, such a fishery ought to yield above thirty tons of first-class animal food per annum. Let anyone determine the extent of pasture requisite to send such a weight of beef or mutton into market, and then ponder on the single, as well as the collective value, of our rivers as food-producers. Such ought to be, but is far from being, the condition of the majority of our streams; and having dallied sufficiently with the ideal, let us come to the real.

Observation and experience alike prove that the Salmonidæ require a free passage from the sea to the sources of the streams they frequent. Where no insurmountable obstacles exist, we see them sowing the seed of an incalculably rich harvest in the smallest tributaries; and on the other hand we know from evidence collected on our own as well as the larger waters of America, that in the ratio in which impediments in the beds of rivers increase, salmon decrease. It cannot be doubted, therefore, that a right of way is, par excellence, the condition most essential to the prosperity of our inland fisheries. In this country unfortunately barriers—more or less formidable—are found everywhere, from the rustic mills damming up bright rivulets, to the monster factories whose gigantic wall weirs bar our largest streams. As a consequence salmon have died out from the majority of our rivers, whilst only a few remain which yield large or regular supplies of this valuable commodity.

The necessity of granting a free passage to migratory fish has been recognised in this country by a series of Acts extending from the year 1218 to the year 1861, and to the spirit of these Acts we must return if our waters are to be cultivated. Here we meet the first difficulty, a difficulty which can be overcome either by legislation or the voluntary united action of proprietors of water property. We will consider each case separately.

In the forthcoming bill large powers should be given to the inspectors of salmon fisheries. They should be empowered to examine and determine the legality or illegality of all weirs, which might be classified as non-injurious, injurious, or destructive. If legal and obstructive, the conservators should be required to erect passes subject to the approval of the inspectors, such approval to be grounded on positive evidence that fish actually pass with sufficient ease; if illegal, the proprietors should build passes under the same supervision. Nothing short of this will benefit our rivers; anything less will render legislation only a waste of time and money. If any weir be declared impassable during ordinary floods, such barrier must be reduced to a height determinable by the inspectors, and a pass erected. It is unnecessary that a stream should constantly be maintained through all ladders. In large rivers salmon move steadily and constantly onwards, but in smaller streams they travel only by night or during freshes. In the former class, sufficient water could always be spared; in the latter, if the supply is employed for milling purposes during the day, we may reasonably expect the salmon should have the benefit of it during the hours of darkness. Even should the lessees of mills lose some driving power, and the owners in consequence be obliged to lower their rents, we contend the increasing value of their water property would more than compensate for a temporary diminution of income. The public are well aware that many fish-passes are failures: some from construction, some from too much, some from too little water; but if the new bill gives conservators sufficient power, these mistakes will soon be remedied. It is needless to offer any suggestions on the form or position of fish-passes. During the last eight years there has been a growing tendency in favour of copying nature; we would only observe, therefore, that passes—as far as may be—should resemble natural salmon-leaps both in material and design. All we contend for is, that they answer the end for which they were built. It has been suggested that the Land Consolidation Act might be made applicable to boards, to enable them to raise funds to buy up weirs. Such a suggestion is certainly worth the attention of Parliament, and would be useful in many cases. Steam also, in a variety of instances, might, as shown by Mr. Thomas Ashworth, be advantageously employed instead of water power, to the mutual benefit of mill-owners and river proprietors; but this is a question which belongs rather to individuals than to the public.

Another condition essential to the well-being of our rivers is, that capture shall bear some proportion to reproduction, and this brings us at once to the subject of nets. Wherever salmon are found in any considerable numbers, draughting is carried on so ruthlessly that in effect a wall, slight but nearly impassable, is stretched across the river. The enormous nets now in use are so well made and managed, so constantly employed by day and night, that upper proprietors—the owners of the most important spawning beds—are deprived of their rights. The present system practically gives a monopoly to the nets in the tide-way. This is not only a great injustice but a great error; and if suffered to continue can only end in the gradual decay of our fisheries.

A salmon river without a stock in some measure proportioned to its extent, resembles a farm which has been suffered to run out; and the wholesale destruction of which we have spoken must regularly and inevitably reduce that stock year after year to a lower level. It does this directly as well as indirectly: directly, because destruction is greater than reproduction; indirectly, because injustice makes the aggrieved breeders and rearers of the fry careless as to what becomes of it, and so it comes to pass that the upper proprietors not unfrequently sweep their pools, whilst too many of the mountain tributaries are practically handed over to the poacher. If this state of things is allowed to continue our rivers are doomed; but we cannot believe that so a great a public and private wrong will be practised. The remedy for the evil should not be difficult. Unfortunately recent legislation, with the best intentions, weighed out its remedies with so nice a hand, that the scales were always at an equipoise, and the most heroic practice exhibited in the Acts of 1861 and 1865 was that of robbing Peter to pay Paul. Now, however, we may hope that a strong Government will deal in stronger measures, and in the promised bill reduce the length of draught nets, shorten the time in which they are to be used, and increase the size of the mesh. Nor is this all, for the weekly and annual close seasons should be carefully considered, not only with a view to lengthen the fence time, but also to the adoption of a sliding-scale, based on a calculation of the rate at which salmon travel under certain conditions.

In many rivers the fish have to run above a hundred miles before they are clear of the nets; and it is plain that they will not traverse the whole distance in the thirty-six hours which constitute the weekly close time. Such being the case, the law as it stands merely transfers the salmon from one set of nets to another, whilst the upper waters, which it was proposed to benefit, gain nothing. To obviate this evil, a sliding scale has been proposed, the nature and bearing of which we give in the words of a well-known conservator of the Severn:—"I propose," writes this gentlemen, "that all salmon rivers be classed under two heads, viz., first and second magnitude. That for those of first magnitude, the weekly close time be fixed at sixty hours, commencing at six o'clock on Friday evenings, as respects the first forty miles from the sea, and twelve hours later as respects each succeeding thirty miles, continuing for sixty hours in each case. That for those of second magnitude, the weekly close time be fixed for forty-eight hours, commencing at six o'clock on Friday evening, and twelve hours later for each succeeding twenty miles, continuing in each case for forty-eight hours. The Act should be decisive; it should fix a penalty of £50 in every case of non-observance, or in any way obstructing the free passage of fish during the aforesaid close time; half the fine to go to the informer and half to the preservation fund."

The adoption of such a plan as the above would be of incalculable service to our fisheries; it would conciliate the upper proprietors; inevitably benefit the netting interest; whilst it would throw a great additional weight of animal food into the market within three years. The application of such a sliding scale will, however, necessitate a clause in the new bill, restricting the use of nets to a given distance above the tideway. This arrangement would convert the higher parts of rivers into valuable rod-fishings, and prove a sure source of income.

Having touched on "free passage and restricted netting"—two of the most essential points in the future of our salmon rivers—we need only glance at the subject of pollutions. On this question Mr. Hugessen observed, "as to pollutions he thought the deputation were wise in waiving it. The Government would not press that matter in a salmon bill; but, no doubt, when the sanitary question came before them, the salmon fishery interests would get what they wanted." We desire nothing better than that the words of the under-secretary may prove prophetic.

And here we might pause, were it not that the latter half of our title justifies us in offering—not for the first time—a suggestion by which we believe the prosperity of our inland fisheries could be increased through private co-operative enterprise rather than by mere legislation.

The interests of every river should be one and indivisible. They who breed ought to participate in the profits of those who catch the salmon, for the fish cannot belong to any particular portion of a stream. Nature marks them as common property, not as objects of monopoly. Bred in the tributaries they are fed in the sea, and should be regarded as a source of revenue to all. If rivers above the tideway are private property, why should they not be considered as water farms, the stock of which belongs to all the rightful owners? Establish this doctrine, and cultivation must follow. It is the want of protection that has hitherto crippled enterprise in this direction, for who would expend capital on nurseries, improvements, or efficient protection, with the certainty that the lower nets would reap all the benefits of his exertions? Once, however, make any river the property of a joint-stock company, with the owners of ripal rights as shareholders, and nine-tenths of the difficulties which have hampered and impeded legislation are at an end. Parliament, however, would still be called on to do something, for monopoly in the tide-way must be crushed, and any upper proprietor unwilling to participate in the undertaking, be obliged to cede his ripal privileges to the company at a fair compensation, with the option of redeeming them at the expiration of three, five, or seven years.

We believe this, or something like this, will yet be done. We earnestly desire to see it accomplished, for then, and not till then, will our inland fisheries yield their strength, and our poor rejoice in the abundance which has been created. Meanwhile, we look with no little anxiety to the bill now being prepared, and trust it may long stand as a monument of the boldness and wisdom of those who framed it.

The Chairman wished to make a few observations on a subject connected with the question, though not bearing directly on Dr. Peard's paper, because Mr. Frank Buckland was present, and he wished him to answer what he was now going to ask. He believed the Thames to be in a state at the present time to yield salmon. He had seen thousands of the most beautiful fish turned into the Thames at Mr. Ponder's, at Hampton Court. Very few, if any, of these fish reach the sea. The error was in turning them out when they were only twelve months old. Nothing could be more beautiful than this young fry, but they only became food for the larger fish. So long as Mr. Ponder turned his fish into the Thames at one year old, he would have no salmon, but if he kept them until they were two years old, they would be by that time quite healthy and fit for what was before them. He hoped, therefore, that Mr. Buckland would state his views on the subject; and, whether or not, Mr. Ponder should keep his fish until they were two years old. It was his candid opinion that, as a salmon river, the Thames might be made to yield 60,000 fish per annum.

Mr. Frank Buckland said he had listened very attentively to the paper which had been read, and he regretted very much that Dr. Peard was not present to answer any objections advanced against anything he had said. First of all, he wished to say a few words on the subject the chairman had brought before the meeting. There was no doubt that within the memory of man there had been salmon in the Thames; he had seen the person who caught the last one; this was only 40 years ago. Now, he asked, how was it there were no salmon there now? He believed the answer to that was the weirs had been their destruction. Mr. Ponder and himself had been working the Thames for seven years, and both had come to that conclusion some years ago. Now it must be seen whether they could get the fish back again. The young ones had been put into the river, but only two had been caught. A man came to him (Mr. Buckland) and told him that he had caught a salmon, and had had the impudence to eat it. That and another instance were the only cases he had heard of. What became of these young fry? The Chairman had said that they were eaten up by the big fishes, and recommended a pond for their reception. But, as there was no pond for them, the fish were put where, after much thought, it was considered best, and where they could easily be found. They were not turned out anywhere, but they were turned out where their mothers used to turn them out. He quite agreed with the chairman that if they could be kept two years instead of one it would be much better, and it would afford him much pleasure to bring the Chairman's suggestion before the Thames Conservation Board. He was sure a pond was not the place to bring up young salmon, and, therefore, Mr. Ponder and himself preferred the running stream. There was another thing to be remembered, these experiments cost money, although success was to be attained not so much by money as by hard work. In 1868, he sent from his own cases in the Horticultural Gardens 7,800 salmon. He did not suppose much would come from turning out this number. Those sent were the celebrated Rhine salmon. With regard to Dr. Peard, like all salmon authorities, he was not quite right in all his points. He (Mr. Buckland) disputed entirely Dr. Peard's remarks that our salmon fisheries are declining. He could not allow the idea to get abroad that the English fisheries are going to the bad. There were in England at the present time no less than twenty-four Boards of Conservators. The chairmen were gentlemen of position, and the gentlemen who form the Boards had the subject thoroughly at heart, and in many cases their labours had been well rewarded. There were more fish in the Severn than hitherto, and with regard to the Wye the dispute was not as to the scarcity of fish so much as to who gets them. If there was any new legislation on the subject, the salmon fisheries of this country would be very valuable. But we must not be in a hurry. The first law that must be made must certainly be with regard to weirs. There could be no doubt that a free passage from the sea up the river was important. The argument we met with, was, that the manufacturers' interest is greater than the salmon interest. It was so in some cases, but not in all. He was of opinion that, with a little trouble, our fish can be passed over every weir in the country without injury to the mill-owner. The mills did not require motive power at night or on Sundays, and why should the mill-lessee not put his hatches down when not using the water? He fully sympathised with the upper proprietors. They ought to have every privilege afforded them, but it must not be forgotten that they have September and October, when they can fish with the rod. There was another point which he mentioned with great reservation, though perfectly sure of its being a fact. A river might be without a weir, or without pollution or any obstruction whatever, and still the salmon would not go up it. Legislate as much as you like; they won't go up until the flood, and then the upper proprietors get their share. He could not explain how this was; something within the salmon—perhaps an instinct. As regards nets, this was a difficult branch of the subject to legislate upon, yet it was very important. No one net was applicable to all rivers. Take, for instance, the hang-nets, they had done well in some rivers, but it did not follow they would do well in all; in the Severn, for example, they were obliged to adopt quite another plan. These things would have to be managed by bye-laws. He agreed with Dr. Peard that we should have sliding-scales, and he had no objection to the £50 penalty for those who fished during prohibited hours, but it was hardly practicable. In fact, Dr. Peard's paper was an outline sketch of the present state of the salmon laws. His colleague and himself had been working hard at their report, and he was glad to say it was now in the hands of the printer; and in that report there would be found grounds for repeating that there is no authority for Dr. Peard's statement that the salmon fisheries are declining, as they are undoubtedly increasing.

Mr. Chadwick (from the Ribble) said, after the observations of Dr. Peard, and what had followed from Mr. Buckland, he had not much to say, except with regard to the increase of salmon. He was only acquainted with one river, the Ribble, and, so far as that river was concerned, the following was the case. In 1859, the salmon taken did not amount to 100. It was certainly a dry year. During the last three years between 5,000 and 7,000 had been taken. There were many places high up the river which had formerly no yield, but which are now realising considerable quantities. On the subject of weirs there was no complaint; and the first point to be considered was this question of weirs, as until there is a clear way for the fish to get to the top of the river, it was impossible to have the river well-stocked. The reason was that the water has not been sufficient to bring them up. He believed this would have been the case if there had never been a net in the river. In the Odder, in 1859, there had been some amount of young salmon put into the streams, hatched on the property of Colonel Townley, and the result was so discouraging that Colonel Townley reluctantly gave up the experiment, and devoted his appliances to trout.

Mr. Walpole said he would not like to be entirely silent on the occasion. He could endorse the denial given by his friend and colleague that the salmon fisheries were decreasing, and the strongest denial of the charge was the statement of Mr. Chadwick. But Dr. Peard had instanced two rivers, the Wye and the Tyne, and had stated that our rivers are deplorable. Dr. Peard could not have been more unfortunate in his selection. The Tyne was the one English river, not excepting the Ribble, which was the most peculiar instance of the great advantages which we had derived from the legislation of 1861. The range of the Tyne was through a thousand miles of country. Its two large tributaries were closed, leaving 500 miles open to the fish. Nine years ago, the fish taken in the Tyne might be counted on the fingers, while last year the Tyne supported 1,200 net fishermen. Now, if a small river, not one-tenth of the size of the Thames, can support 1,200 net fishermen, that a few years ago hardly had a fisherman upon it, it was impossible to maintain that the salmon fisheries are decreasing. It also proved how salmon fishing can be brought back to a river. Nine years ago the weirs were closed. Since the passing of the Act, the salmon of the Tyne had constantly increased. The one thing we should have ever in view was this, the fish should be allowed to pass up the river. He was slightly disappointed at the means Dr. Peard would employ to improve this condition. In considering this question from a practical point of view, there were a great number of difficulties which Dr. Peard did not seem to know of. Dr. Peard seems to have applied the laws he considers a failure to one or two of the largest commercial rivers in this country, and concluded therefrom that the same was true of the whole. As to weirs, it seems that the case really turned on this point—are they legal, or are they illegal? If they are legal, surely we had no right whatever to take away our neighbours' property to please ourselves. Of course we could take it away if we gave him compensation, but not otherwise. We were not so much in want of statutory power as of money. It was asked why is salmon not reared in the Thames, but it should be also asked who will help to make the weirs so that the fish can pass over them. The real difficulty was this, that all the valuable fish in the country is common property, for which any one can go and fish, and until there are some means of terminating these common rights, it was useless to talk of cultivating salmon in rivers. He would very much like to see the efforts of Mr. Buckland carried out on the Thames, but he was afraid they would prove nugatory. The weirs had been the ruin of the salmon fisheries in this country. Up to 100 years ago there were no pound locks in this country. The only way then to pass a barge was to draw it up an inclined plane, and the salmon went too. Formerly the navigation interest was not opposed to the fishery interest, but now these interests were against each other. When we had the sloping weirs, our fish could swim them, but now that we have the perpendicular weirs the fish could not spring over them. There were some very interesting statistics compiled a few years ago, which gave an account of all the salmon caught at Marlow from 1794 to 1820. There was a note to say that if this time had been taken to 1774 the average would have been much higher than the statistics show for the years mentioned. From 1794 the salmon began to decline; even in 1811 the fish was getting very rare, until, in 1820, the last one was caught. Daniel, in his "Book of Sports," says that in 1804 there was no weir across the Thames below Marlow. In 1811 Teddington weir was built. This perfectly demonstrates that the salmon had been decreasing in proportion as the weirs had been built; and that salmon will not flourish until the weirs are removed.

Mr. Lindon would only offer a few remarks upon the observations of Mr. Walpole. He quite agreed with the concluding portion of his speech, and wished to add that he believed sewage had a great deal to do with prepreventing the passage of salmon up the river Thames.

Mr. Walpole—A smelt was caught at Kew, and if a smelt can pass up the river salmon can.

Mr. Lindon—A smelt is not such a clean water fish as salmon.

Mr. Walpole—The Tyne is much fouler than the Thames, and yet, notwithstanding the large quantity of salmon destroyed in passing Newcastle, the river was plentifully supplied. Sewage would not stop salmon.

Mr. Lindon was not of that opinion. He did not think that any young salmon turned out at Hampton Court would ever get down to the sea. He quite concurred in Mr. Buckland's remarks, that the best place to turn them out was where their mothers used to turn them out; but with the river now so full of pike and perch, they soon fell a prey to their enemies. The only chance for the Thames would be to turn out the young fish higher up.

Mr. F. T. Porter, of Dublin, wished to make a statement on a matter which was connected with some of the Irish rivers. In that beautiful vale which Moore speaks of as—

> "The vale in whose bosom the bright waters meet,"

a family named Howard at one time paid £400 per annum rent. Some copper mines were opened, and the water from them allowed to flow into the river. It looks beautifully clear and limpid; but there is no vitality in it, and no salmon can be caught. With regard to the effect of sewage, he instanced the Liffey. He remembered that as a very excellent fishing-river. He had seen trout, if not salmon, there; but now there is no fish at all in it, and this is in consequence of some paper-mills that have been recently opened. He begged to give them another fact of his own observation in 1821. In Wexford there is a river into which some persons had allowed foul water, in which flax had been washed, to run. This destroyed all the fish; even the eels were killed. The proprietors were extremely indignant, and offered very large rewards for those who had perpetrated the offence, but no discovery was made. The next year some fish came up from the sea, and soon the river became one mass of salmon fry, because all the enemies of the salmon had been poisoned by the pollution, and the river was now free from them. He had heard it said that it would be a very good plan if these small rivers could be effectually weeded before more valuable fish were let into them.

Mr. Ledger said, with regard to the purity of the Thames, he thought that the greater purity now observable in the neighbourhood of London had been obtained at the cost of pollution lower down the river. He presumed that if the smelt had got up to Kew it had passed safely through the sewage. With regard to the remarks that had been made as to the age at which Mr. Ponder turns out his fish at Hampton Court, he would suggest that it would be a good plan if they were only to be turned out in alternate years. The longer the distance fish had to travel the greater the risks they ran from their enemies. He was convinced that, at one time, the Thames produced salmon. A man had told him that he watched forty fish go over one weir. He did not think that the explanation of Mr. Walpole was sufficient to account for the entire absence of salmon from the Thames. These locks had been growing for a hundred years, but Mr. Walpole admits salmon, in 1804, at Marlow. If this theory were correct, the fish must have been seen below the first lock. Salmon could easily get up beyond Teddington, as at high water the lock was completely submerged, and fish could go over at that time. If we do not see fish at Teddington, and below Hampton, it is not the locks that excludes them. We must seek some other reason, and he was afraid it was to be found in their enemies, more than in any pollution. It was not sewage he referred to, but pollutions of a different nature. The "preparing" process had not been done properly. The first thing was to make the Thames in a healthy state, in order that you might know that fish which reach the sea will return.

The Chairman, in moving a vote of thanks to Dr. Peard, said he thought Dr. Peard had hit one great nail on the head when he urged that we must give the salmon a free course. He could bear testimony to the large increase of spawn in the Tyne. Two years ago he had to send up to the Tyne to get spawn for Australia, and in a few hours he obtained some hundreds of thousands of eggs.

Cantor Lectures.

The first lecture of Mr. Anderson's course "On Applied Mechanics," was delivered on Monday evening, the 12th inst.

Eighteenth Ordinary Meeting.

Wednesday, April 14th, 1869; Sir William Bodkin, Assistant-Judge, Vice-President of the Society, in the chair.

The following candidates were proposed for election as members of the Society :—

Arter, Andrew, 8, Walton-villas, S.W.
Ashton, Joseph, 59, Fleet-street, E.C.
Barnard, George William, 156, York-road, Lambeth, S.E.
Beamish, Captain H. Hamilton, R.N., 45, St. George's-road, Eccleston-square, S.W.
Benwell, J. A., 5, Upper-grove, Kensington, W.
Berthon, P. H., 20, Margaret-street, Cavendish-square, W.
Birch, Charles Bell, 12, Alpha-road, N.W.
Biss, William H., 25, St. Stephen's-road, Westbourne-park, W.
Bisson, F. S. de Carteret, 24, Charles-street, St. James's, S.W.
Boekbinder, J. M., 49, Thornhill-road, Barnsbury, N.
Borrett, Thomas, 15, Bryanston-square, W.
Bowyer, James, 10, Tavistock-square, W.C.
Boyer, Joseph, 4, Codrington-terrace, Notting-hill, W.
Bradley, Charles Lawrence, 4, Belitha-villas-west, Barnsbury, N.
Breach, James G., 14, Prince of Wales-terrace, Kensington, W.
Brett, Edwin J., 311, Camden-road, N.
Brittain, Thomas, 22, Cleveland-road, Downham-road, N.
Brucciani, Dominico, 10, Onslow-gardens, S.W.
Buckingham, J. H., 35, Wood-street, E.C.
Burr, John, 8, Bolton-road, St. John's-wood, N.W.
Cochrane, Alexander Baillie, 26, Wilton-crescent, S.W.
Cockerell, William, 3, Pump-court, Temple, E.C., and Cambridge.
Durrant, George C., 20, New Bond-street, W.
Lacey, Charles J., 1, St. John's-villas, Haverstock-hill, W.
Todd, Arthur, jun., 30, Milk-street, E.C.

The following candidates were balloted for, and duly elected members of the Society :—

Abraham, Philip B., 6, Old-square, Lincoln's-inn, W.C.
Andrews, James, 10, Northampton-park, Islington, N.
Arnott, Neil, M.D., F.R.S., 2, Cumberland-terrace, Regent's-park, N.W.
Clare, Edwin, 104, Guilford-street, Russell-square, W.C.
Cockerell, G. J., Upper Sydenham-hill, Kent.
Death, F., Woodstock-house, Hendon, Middlesex.
Fowler, William, 30, Lombard-street, E.C.
Gwynn, William James, Manor-house, Forest-hill, S.E.
Hambro, Charles J. T., M.P., 14, Cavendish-square, W.
Haynes, W. J., 9, Westbourne-villas, Forest-hill, S.E.
Kemp, Edward Owen, 7, Lincoln's-inn-fields, W.C.
Lascelles, W. H., 121, Bunhill-row, E.C.
Layard, Right. Hon. Austen Henry, M.P., 130, Piccadilly, W.
O'Neill, Lord, 19, Belgrave-square, S.W., and Shanes Castle, Antrim.
Pegram, Orlando A., 13, King-street, Cheapside, E.C.
Rabbits, W. Thomas, Selwood, Mayow-park, Forest-hill, S.E.
Ricketts, Charles R., 13, Albert-road, Regent's-park, N.W.
Seabrook, Charles, Grays, Essex.
Smith, George Mence, The Chesnuts, Bexley Heath.
Waterfield, O. C., Temple-grove, East Sheen, S.W.
Weguelin, Christopher, M.P., Ranelagh-house, Arabella-row, S.W.

The Paper read was—

SPAIN COMMERCIALLY AND ECONOMICALLY CONSIDERED.

By E. M. Underdown, Esq., Barrister-at-Law.

The country of whose physical, commercial, and economic features I shall endeavour this evening to give as lively a sketch as my personal observations thereon will enable me to do, is surrounded, in the minds of most persons, with a peculiar interest, generally speaking, coloured with a kind of romance, naturally arising, partly from the general ignorance of the real state and characteristics of the country, and partly from the accounts, history, and representations of it having been confined and limited to incidents possessing in themselves most of the elements of the picturesque and the romantic.

Such are the battles of the sturdy Christian with the swarthy and infidel Moor, whose palaces and fortresses of oriental splendour exist to this day, colouring the architecture of Europe, so to speak, at its south-west wing with the hues of the East, as the palm, the pomegranate, and the sugar-cane give its vegetation and its scenery a tinge of Orientalism. The valorous and punctilious Don, fighting now the wretched and benighted Mexican and Peruvian, now the vulgar Dutch or the prosaic Englishman,—the magnificence of the clergy, the burnings and dungeons of the Inquisition—the stately pile of the Escurial—the cathedrals of Burgos, Seville, and Toledo—and, later, the lithe and active bull-fighter doing his deeds of blood before the delighted gaze of tens of thousands of excited and bloodthirsty spectators, men, women, and children. But of her realities, her laws, customs, and the real life of the people, less is known than of any other country in Europe.

I fear that my duty will be to ask you to clear your minds of a good deal of this mediæval and Oriental haze, and calmly examine this land of Spain, and listen to my words without even the imaginary accompaniment of the guitar and the castanets;—remembering that, as it is to the eye of the student of humanity and the political economist, the most dreary of states, so it will be found to be the most prosaic, and, spite of its clear sky, most dismal of lands, peopled with the most matter-of-fact, sober, melancholy, poor, ignorant, and, of necessity, narrow-minded of populations. I speak thus strongly, at the risk of offending my Spanish friends; for it is impossible to conceal from oneself the fact that inordinate conceit of self and of country is one great obstacle to the progress of Spain. The Spaniard will not see himself as others see him; he is morbidly sensitive to ridicule; he is perpetually with his head in a bush. He tells laudatory untruths about himself on principle, hardly hoping they will deceive anybody. In the midst of rebellion, according to his statement, tranquillity always prevails. When Cuba is practically lost, and utterly ungovernable, the rebellion is announced to be at an end. With national debts unpaid, Spain brags of her wealth, and abuses her beggarly creditors. In unparalleled ignorance she talks of her enlightenment and civilization. With paganism almost unaltered for thousands of years, she calls herself the great missionary country —Heaven save the mark! And yet with all this, the Spanish people (properly so-called) are a good, frugal, temperate, obedient, and generally industrious people, home-loving and affectionate members of families; although poor not inhospitable, though, indeed, hospitality is not the custom; fond of law, order, and government; well-mannered and dignified, with strong religious feelings.

The evils I have to mention all come from above, not from below. Not one of the Spanish vices, national or personal, is the vice of the genuine Spaniard; they are all imported; but as they have found in many sentimental qualities of the people the materials for exaggeration, these have flourished with a rankness which has choked their better and more valable qualities.

A powerful religious fanaticism, arising from religion having been for centuries a war-cry in the fight of race against race, has exaggerated their reverential and religious feelings to superstition, rancour, and intolerance, and has preserved the identical idolatries of the ancient Iberians, merely clothing them with new religious associations,—their realism being the more inviting, as having been patriotically contrasted with the simple worship and monotheistic creed of the priestless Moslem. The subsequent success of what are called the "Spanish arms," when aided by German Emperors, and commanded by Italian Generals, still makes a Spaniard believe he can conquer the world—as he believes he conquered the French in the Peninsular War—(for in Spanish histories neither Wellington nor the English armies appear at all); it also induces him to bear the atrocious military rule, which is still unchanged; and, unless this revolution takes quite another turn, appears to be unchangeable; sapping the resources of the country, at the same time that it protects all the evil interests at the expense of the good.

The effects of the plunder of the Indies by the filibustering Cortes and Pizarro, who destroyed civilizations far in advance of their own—then and now, survive till this day, when Cuba and Manilla are made the means of enriching all the adventurers who have either served the governing faction of the time, or have made themselves dangerous to it. I must tell you a story, cited by Mr. Lecky in his new book, of Pizarro and Cortes, and show you how much their missionary efforts were appreciated by the Indians. They were told that if not converted to Christianity they would be reduced to bondage. Immense numbers of them committed suicide to avoid this; but the Spaniards, knowing what the belief in a future state was likely to effect, were too much for the unhappy natives, for they threatened that if the Indians committed suicide, they, the Spaniards, would commit suicide, find their captives in the other world, and treat them all the worse for it. This had the desired effect, the unfortunate Indians lost even the terrible refuge of suicide, and their hopes of rest hereafter.

Like many a bankrupt gallant gentleman, Spain looks upon creditors as very poor creatures indeed; but having cut down all his timber, gambled away his estates, and disgusted his friends, he finds no percentage high enough to tempt the usurers, and had better do what he should have done long ago, turn himself and his children to honest industry, both of hands and brain.

This I long to see, and hope to see, though, of course, so long and so deep a demoralization cannot be eradicated in one or two generations. Of their obedience and reverence advantage was taken to consolidate one of the most despotic monarchies, one in which Divine right has been asserted to a greater extent than almost anywhere else, and where, since Ferdinand's time, a powerful monarchy has worked under a powerful priesthood, though in a country where Constitutional Government was flourishing when we were but learning the first principles of freedom. But we have worked from the roots, they upon the branches. They have been occupied with "crowning the edifice," while we have been working at the foundation. This is the inherent vice of the Latin races. This produces the France and Spain of to-day, side by side with the England and America.

Now what ought Spain and Spaniards to do? and in what can we help them, and to our mutual profit? Perhaps disinterested kindness, both in nations and individuals, is worth very little indeed.

We must leave the poetic, Catholic, warlike, conquering, filibustering, bull-fighting Spaniard behind us, as there is really reason to believe the French are at last doing with the Napoleonic and Louis Quatorze model Frenchman. Don Quixote is a failure, and an anachronism. Let us see what we can do with Sancho Panza. How Cervantes understood his country! How little he would find it changed. The Don is still careering away at a Cuban windmill, having long been occupied in worshipping the virtues and charms of a Dulcinea del Toboso, in the person of Doña Isabel de Borbon. How long will he keep poor Sancho away from his wife and family, getting hard knocks and bad living in pursuit of adventures which only make himself and his master ridiculous?

Mr. Buckle's sketch of Spain is most valuable, and of course has for its basis the physical geography and conditions of the country as influencing the character of the people. Physical conformation will always do this, but less and less so as to their moral characteristics, as communication both by travelling and transmitted intelligence increase. All national life will become more and more assimilated as these are improved. Not that I believe the differences of race can be eliminated until after periods of similar conditions, of a length now impossible to calculate, shall have passed away. Suffice it, however, to say, that with railways, telegraphs, newspapers, scientific instruction (which had, of course, been practically stifled while the church had power), immigration (which was difficult under the disadvantages Protestant settlers suffered under until now), machinery, and the travelling into other countries by the Spaniards themselves. Spain will be so much more assimilated to the rest of the world, that her better constituents will acquire power to the destruction of the worse; and those portions of her inhabitants whose characters and capabilities are fitted for modern progress and modern work will, combined with immigrants, bring her back, if not to the proud position of southern Spain under the Moors, at once the richest, best cultivated, best administered, and most learned portion of Europe, at least to one that shall not be an opprobrium and a shame to her people.

After writing this I find the passage of Gibbon—Vol. ix, cap. 51. The traveller from Granada to Cordova and Seville most draw the contrast for himself between this and the blessings of the subsequent Christian dominion of the Spanish monarchs, since the civil expulsion of the Moriscoes—the industrious descendants of these Moors.

Spain, physically, is so utterly unlike any other country in Europe that I must ask your particular attention to a few words of description, which may do away with any of your preconceived ideas. A huge table-land sloping rapidly to the sea round the coasts, but broken into two plateaux, the upper comprising the Castiles, Leon, Navarre, and Arragon; the lower Andalusia, and parts of Estramadura, Granada, and Murcia; the table-lands intersected everywhere by barren chains of mountains, ill-watered, without trees, and to the rapid traveller appearing almost devoid of vegetation (the slopes to the sea alone resembling the coasts of southern France and Italy), swept by cutting winds, in winter chilled by the snows of the mountains, and in summer burnt by a pitiless sun, whose beams are seldom intercepted by clouds of moisture, and for which no tree gives a shade. Great part of Spain resembles now a steppe, now a sahara, and differs as much from the gay and sunny Spain of the poet, as the sombre Castilian does from the theatrical Spaniard, who, however, better represents the Andaluz, for, like the Neapolitan, he shares the richer and more oriental character of his province. The dry brown soil looks like the desert; the crops grow rapidly and are soon off the land; of pasture there is very little, and until we have examined the magnificent quality of the alluvial soil, from three to ten feet in depth, we can hardly form an idea of the possible riches of the country if water could again flow over it.

The towns, few and sombre, appear all towers and domes; other huge masses of buildings are the convents, which, if not abandoned, are barracks. One can see nothing of Spain without the association of a monk or a soldier. Twenty years ago the Spaniards rose against the monks, and slew them like the priests of Baal. Now the liberal Prim is slaughtering the Cadiz people for opposing the conscription and protesting against the army, an incubus as bad as the monk, as useless, as wicked, and more expensive.

From what I have said, it is clear that nearly all Spain is a great agricultural plain, consequently, first and foremost, it should be peopled and cultivated; for this irrigation, agricultural machinery, and increase of population are necessary. The government and the foreigners have only to do with the former, of which more anon. The wicked prodigality and stupidity which has cleared the mountains of wood, even brushwood, must be reversed, as it has been in France, where they have found that the bare hills are the great causes of the disastrous floods; a mountain stream tears down the side of a barren hill, *et vires acqurit eundo*, spreading devastation in its path, while on the wooded and grassy slope the same water but trickles slowly round the roots, and through the grass and herbs. In Spain, however, the arid sierras are like African mountains, they retain no moisture; for vegetation, as it requires, so it perpetuates, humidity.

The neighbourhood of Madrid, once a great forest, is now more like the coasts of the Red Sea or the summits of Dartmoor. The rivers are few; and, as may be seen from their straight courses, they soon run rapidly down, and, consequently, wear out deep channels, into which, in their turn, rapidly run the mountain streams, eating out deep but smaller gorges; the effect being to leave the land on either side unwatered. How the skilful Moor avoided this, we shall see. Again, from this rapid fall results the small extent of the river navigation in Spain. Only four rivers of the peninsula are navigable to any distance from their mouths, although the Tagus, with but little work, might be made a carrying stream, even up to Toledo. I suppose this river has been as little travelled on as the Niger—a boat went down it 300 years ago. I had, with some friends, the idea of descending it to Lisbon, but the enterprise is one of some difficulty, and the views of food entertained by the provincial Spaniard are difficult to reconcile with our own. The Ebro may also be canalised. This is an old idea.

The ports of Spain are few, and not generally good. Vigo, Carthagena, and Barcelona, are good; the two first are magnificent. Santander and Bilbao are both difficult of access, and with formidable bars.

Spain is so regular in shape that her sea-board, in proportion to her area, is extremely small, hence the vast distances for land carriage are unfavourable to her as a corn exporter, should she become the great corn-grower she might be.

This brings me to her communications, which may be said only just to have been developed in any degree, and very imperfectly even now.

The railways of Spain issue in radii from Madrid, and there is little or no communication between the various ports and cities. The Spaniard travels little, and as there are no manufactures there is but little transit. Each place supplies the frugal wants of its immediate inhabitants. Corn, wine, oil, garlic, and a few herbs grow everywhere—so would sugar-cane, beet-root, tobacco (if not forbidden by Government to encourage Cuba)! Formerly rough cloth, was made in Spain, now, or lately, all was smuggled in to cheat the revenue and enrich the revenue and government officers, the people paying dear to encourage native manufactures. All articles of household use, as knives, needles, &c., are miserable from the same cause. One great bitterness of the Spaniard is that the English, out of jealousy, destroyed the manufactory of Buen Retiro, near Madrid (where they made china somewhat like the old Chelsea), fearing lest Spain should ruin her trade in crockery.

The roads are generally (where they exist) pretty good, but the great roads only were so, and they followed nearly the track of the present railways, and travelling was about as rapid as in the days of the first Georges. There are no canals of any consequence, and the coasting trade is small; indeed, internal communication was little needed for the reasons I have given. Her railway system is clogged by fraud in every detail of it. Poor Spain, as usual, has been provided with railways by the beneficence of scoundrels; they are, with the exception of the Bilbao line, wretchedly-made single lines, which have cost enormous sums, yielding little or no returns. And here, a word about foreign speculators and lenders to Spain, who so deeply complain of their losses. In almost every case the speculator or contractor, or what not, has been bargaining with a rogue in the Government, but that is not all—the speculator has consented to join the rogue in cheating the Government of which he is a member or an agent. The

Spaniard is wily—makes the foreigner *particeps criminis*. By-and-bye, if the honester part of the administration, or, what is the same thing, an administration not sharing in the plunder, finds out the swindle, the payment is objected to, or the speculator finds himself in a difficulty. He then rushes to this government to interfere and help him, misrepresenting matters; and he either gets unjust reparation, or the honest commercial and industrial relations of the countries are disturbed, the evil, of course, falling with double weight upon the weaker and worst-governed country.

This is the history of hundreds of transactions with Spain, Turkey, and elsewhere. Our government should never interfere unless the perfect *bona-fides* of the transaction is shown; when shown, should speak with no uncertain voice, both for its own sake, and in that of the people of the foreign nation, whose interests appear to be opposed but are in reality identical.

It has always appeared to me that there are some countries in which the railroads, considered as public highroads, should be made by the state. Spain is certainly one of these countries. Communications between the different parts of Spain and the capital are absolutely necessary. The produce of Spain requires to be carried from the interior to the seaports, or to France, but the mere carriage of the produce of this country, and of the small number of inhabitants requiring to travel, would never be sufficiently remunerative to support the long and difficult lines of railroad, 300, 400, 500, and 600 miles in length, unless they are treated as enterprises deserving the support of the state. Of course, as in all foreign countries, the system of subventions has been carried into effect in Spain. What has become of these subventions, and whether they have benefited the shareholders in the different railways, is another question. One of the numerous frauds attached to the execution of public works in Spain was, first, to set out for the government surveyors the most impracticable lines that could be found, calculating the expenses upon that route, obtain a concession of so much per cent. thereon, and then immediately make the railway line upon a shorter and more practicable route. This alteration of route then had to be sanctioned by the government, but this was carefully arranged between the engineer of the line and the authorities in Madrid, and the difference of the price was divided among whomsoever it might concern. In passing, I may remark that it appears to me, and for the same reasons, that a country like Ireland should be provided with railways through contributions of the state. We know Englishmen have never been favourable to the system of subvention; but when, as we now see, this system of private enterprise applied to public works has been not altogether successful, and many parts of England are, and must be for many years, deprived of railway communication, in consequence of the disfavour with which these enterprises are now regarded, the system of subventions might, I think, under proper restrictions, present some advantages.

Foreigners' property is well protected in Spain, and all the abuses of the administration of the law are no worse for foreigners than the Spaniards. Indeed, the difficulties of dealing with property in Spain—with common care as to formalities—are less than in England. I shall treat with the law of the registration of real property later.

Now, the cultivation of land in Spain, with modern appliances and English methods, answers wonderfully. My friend Mr. John Bell, banker of Madrid, has had for some years several thousand acres of land under cultivation, just irrigated by some canals I shall mention. The experiment has been very successful, and the results upon the people most gratifying and interesting; the crops are remarkable in number and quantity, and, with irrigation, the results are quite fabulous. I am convinced that immigration of Englishmen, with capital and a certain proportion of labourers, would be attended with the best results. Land is, however, comparatively dear in good situations; the number of crops must, however, be taken into consideration. The Spaniards will cultivate well enough when the water is brought under their noses, but, with the fatal defect of their character—want of power of combination and mutual distrust—they alone will never, in my opinion, cultivate Spain as it should be. Once they had the Moors; they have done nothing since they drove them out; they will do nothing till other Moors, in the shape of Catalans, Germans, or Englishmen, or even Frenchmen, for the wines (of which presently) guide them, and, above all, execute the great works of irrigation and plantation which are needed. Of course, the cultivable area of Spain is small compared with her actual area.

Mines.

The mountains which intercept her transport, and yield so little externally, are, perhaps, the richest in the world in minerals. They have been worked from time literally immemorial. Nearly all the mining of Carthagena is but the grubbing up of old Roman mines, the yield of silver and lead, under our processes, making it worth while to re-refine the old ores already treated by the Romans and their predecessors. Copper, lead, silver, mercury, sulphur, iron, coal, and phosphate of lime all abound. Why they have not been worked I must explain. Why they should not be worked I cannot explain. Paternal government is at the bottom, or rather at the top of it; when I say paternal government, I mean centralised rascality and ignorance.

The law applied to mines was one of the most absurd that could possibly be imagined. You were compelled to keep a certain number of men at work upon every distinct portion of the mine for certain days in the year. It was in the power of any person whatever to watch your working, and what was called denounce your mine to the government, claiming the concession or power to work it for himself. Need I say that there was no mine worked, either according to the law or against the law, which had not an officious gentleman who denounced it; and the only mode of carrying on a mine was to get a friend to denounce the mine *continually*, so that you might have a friendly opponent instead of an enemy. I had an opportunity of speaking upon this matter to some of the influential men in the Spanish legislature, and the law has been considerably modified, and, within the last few months, put into a shape which will render quite possible for foreign speculation to avail itself of the vast mineral treasures in which Spain is so rich. The modes of mining adopted in the government mines were beyond expression ludicrous. One sulphur mine was mined in the same manner as a graveyard—that is to say, if a certain amount of sulphur was sought to be extracted, a pit of the same size as the underlying stratum of sulphur was dug. It never occurred to them to sink shafts and run galleries; the consequence was that some of the richest sulphur deposits, which vie with Sicily if they do not surpass it, are to this day totally unworked. There is a difference with regard to property in Spain, which is a very important one. In England, as you all know, the proprietor of the soil is proprietor of the mines under it. In Spain the proprietor of the soil is no more than a bare proprietor of the surface of the soil; internally it is all the property of the Crown. That leads to what I have already mentioned—any man may denounce, or rather announce the existence of a mine under another man's land, and obtain the power of working it, subject to paying a compensation to the owner of the superficies; and as by a paternal Government like that of Spain it was thought necessary to watch the operations of every man, this kind of spying upon the process of the miner was deemed indispensable, in order to secure his working the property ceded to him. No thought of putting a quit or dead rent on the mine presented itself, and the result of these laws was an enormous number of law-suits, which ruined nearly all the foreigners who took part in mining in Spain, and the almost total abandonment of every kind of mining enterprise. This, I am glad to say, I hope will no longer continue.

Produce.

It would far exceed the limits allowable for this paper were I to go into the various products of Spain. It may shortly be said that, either at home or in her colonies, Spain possesses the most valuable produce, of both vegetable and mineral kingdoms, known to the world. Cuba gave her the finest tobacco; her South American possessions, cocoa and tropical produce; Manilla, tobacco, coffee, &c.; and the Peninsula itself, all kinds of fruits—excellent apples and pears of Arragon, which supplies nearly all Spain; almonds, nuts (which, by-the-bye, are not grown at Barcelona), grapes everywhere at Malaga, and dried for raisins (*ava pasa*), and whence wine is made more plentiful than water; oranges on all the coasts (four orange-trees, at Valencia, will support a family by their yield); the olive, which grows throughout the length and breadth of the land; cork, saffron, and esparto (the Spanish grass, the extent of which is rapidly increasing, used in this country for various purposes including the manufacture of paper). Madder has been successfully cultivated on some estates, drained and redeemed by an English company, on the Valencian coast, with remarkable results.

The Canary Islands, which I visited in 1867, form a most curious, interesting, and valuable portion of the possessions of Spain. Of the seven islands, the chief is Teneriffe, with the magnificent Peak (el Teide). They are all volcanic, and the scenery is most extraordinary and magnificent. The ancient inhabitants, the Guanches, have now disappeared as a people, though traces of their blood can be seen in the people. They were an extraordinary people, and, though insular, strange to say, boats and ships were entirely unknown, as, indeed, were horses; they will not eat sheep to this day if they can avoid it, considering it unhealthy and improper food. Immense numbers dwell in caves; the town of Atalaya (a Moorish name) is a curious theatre of caves—arranged one above another on the sides of a precipitous valley.

The Canaries produce a tolerable wine, badly manufactured, but which was formerly the famous sack, *vino seco*. The great produce now is cochineal, which has sprung up into extraordinary consequence of late years. Cacti are grown wherever there is a piece of safe ground. On it the mother or *madres* of the insects are placed. The plants are soon covered with young insects. After a time the *madres* are taken off in bags; the young "crop" grows to maturity; some are retained to people other plants, and the greater part are carefully picked off by ladies in masculine attire, and gloves on, to protect the hands from the prickles of the cactus. It is packed in bags for England and Marseilles; it sells for 3s. and upwards per pound. The islands are the best suited for its growth, from their deliciously even climate, although so far south, and off the African coast, and from the absence of violent rains, which would, of course, wash the insects off the plants.

They were and may be still called the Fortunate Islands. Even Spanish administration has not marred them. There are no poor; crime is very rare. One suicide took place while I was in the Grand Canary, of a youth, the first for fifty years. They are a quiet, gentle people; they take no note of time, having, so to speak, no seasons. Out of twenty witnesses, labourers, not two knew their ages; men of twenty-five said they were forty, men of sixty that they were thirty, and so on.

Teneriffe is five days' steam from Cadiz. My return *viâ* Morocco showed me how many points of resemblance there are between the Moorish cities and the ancient cities of Spain.

The yield of the wines of Spain is enormous, and alone might make her the richest country in Europe; but all is badly done. The same mode of making wine, or rather spoiling grape juice, is carried on now as in the time of the Romans. At Cadiz and Xeres it is different, because foreigners have introduced better methods. French companies are spreading, and their wines are really excellent.

What have we then commercially and economically to consider? What commerce can be exercised in Spain, either by Spaniards or foreigners?

In the first place, land may be held in Spain by foreigners. In all the civil wars confiscation has never been practised. Here are proofs that the feudal system was never rooted in Spain—felony or forfeiture for treason is a creature of feudal law (though the Easterns too practised it, but not as a legal incident to fealty). In the feudal countries, too, as the feudal tie was constituted by holding land, the foreigner not a feudatory could not hold it.

The evils of the want of cultivation and management of estates has increased since the railways and great roads were more practicable.

Great people find their way to Madrid; French living disgusted them with their country life. Their estates are left to an intendente, and we have the absentee, the middleman, and the poor tenant repeated, but without Mr. Disraeli's damp climate and melancholy ocean, which are said to add to the trials of a race much like the Spanish, both in their faults and their good qualities.

The condition of the vast estates of the ducal grandees, the personal, political, moral, and physical deterioration of the bearers of these titles, the rascality of their administrators, the impossibility of purchasing land by the real farmers, or of obtaining long leases, have produced the wide-spread inclination for communism, which I know to prevail throughout Murcia and Andalusia, the best and richest parts of Spain, and which the ignorance, excitability, and ferocity of uneducated southern people may yet make formidable.

The alteration of the law of descent, about 30 years ago, will lead to the extensive division of these large possessions in the next generation. One Duke has about 20 towns and 80 titles, and perhaps not really a penny of his own. It may generally be affirmed that there are no rich people in Spain. Commerce is exercised to a very small extent, and is generally despised by these relics of an age of grandees. Nothing is thought of but military service or public posts, and both for the same object—to live upon the country's revenues—*vivir del presupuesto*, live upon the budget.

Of the law of Spain, a most important question for those persons or companies who may be disposed to originate or take part in commercial enterprises in Spain, whether in mines, irrigation, agriculture, or other kinds of public works, I have much to say. During the two years of my stay in Spain I was constantly occupied in conducting various suits respecting interests of great magnitude. With regard to the law itself I have nothing to find fault, indeed, I may say that, in some respects, it is admirably clear, and, as to the law of real property, and the regulations for registration of property, mortgages, and leases, we may well adopt it as a partial model for changes in our own law. The *Ley Hipotecaria* of Spain, or the law on the inscriptions of titles to immovable property, has been well translated and edited by Mr. William Grain, notary public, of London, and is published by Sweet, of Chancery-lane. But after having said that the law, founded as it is on the French Code Napoleon, is good, I must go on to say that, in administration, it beats in badness everything that could possibly be imagined of any system of law. But it is administered with a degree of outward solemnity and formality which is perfectly terrific. On one occasion last year I was sitting beside my advocate, in a suit in which I was conducting. I suddenly found myself called to order by the judge, and requested to remember that I was in a court of justice. Astonished at this rebuke I looked at my lawyer, who pointed to my legs. I discovered that I was sitting with those members crossed, a grave dereliction from the solemnity required in a court of justice. I suppose, that so narrowly are these forms of justice watched, that there is no time to execute substantial justice. As an instance of commercial law, I may cite suits which I have been conducting in Spain upon bills of exchange; and the law provides that the drawer of the bill, before he can be sued in an executory suit, must acknowledge his signature—it has neglected to provide that he shall be compelled to acknowledge it—or that evidence may be given sufficient to establish the fact of such signature. My defendant made oath that he really did not know whether it was his signature or not. After consulting all the best authorities, I had to give up the executory suit, and adopt what are called ordinary suits upon proofs. These have been going on for two years, and, as far as I can see, may last twenty. This effect is the result of the mode of carrying on the business before the courts. Everything is written down, legalised, countersigned, and whatever nonsense a man may choose to introduce into the papers of his suit is received by the judge, transmitted to the other side, who may, if he likes, object to your nonsense, and insert as much more as he thinks convenient. This is again remitted to the judge, who, having read it over, remits it to you. You then object to the nonsense on the other side, and insert some more. After a few more oscillations of this kind the judge endeavours to come to a decision upon the papers presented, but these various processes having taken up at least twelvemonths, he probably has entirely forgotten the subject matter; the papers are too voluminous to be read through, and he gives a decision, as I have seen in two cases, entirely distinct from the object of the suit. You then appeal, or your adversary appeals, to the superior tribunal, and the same process is repeated, plus the mass of papers which already existed. It will be easily seen from this that even supposing the judicial functionaries to be honest and industrious, it would be almost impossible ever to arrive at a right decision; but all these legal functionaries are appointed by the Government, and are removeable at the pleasure of the functionary, who is facetiously called the minister of grace and justice. They are political officers, receiving salaries from £120 to £300 a-year, and it may be easily imagined that the wealthy plaintiff or powerful defendant will procure that such mistakes or irregularities may accidentally occur, that any decision against him will be practically of non-effect, and the matter may be spun out until it gets to the Supreme Court of Judicature. There, I am bound to say, as far as I have been able to observe, excepting the delays, an honest judgment is arrived at. In former times the Senate, also a nominated body since 1835, was the tribunal set apart for the trial of its members. I had to conduct the accusation of one of its members before that tribunal. It is unnecessary to say that not only was no decision arrived at in favour of the plaintiff, but that I could never obtain any decision at all, nor any notification of what had been or would be done, up to the time of the dissolution of that august body, during the revolution of last year. While I am upon the subject of the law of real property, and on the authority of the book before me by Mr. Grain, the notary, I may allude to a subject which is of very great importance. One branch of it has lately been treated of with regard to the custody of wills—I mean the custody of wills after their making, during the lifetime of the testator. It is strange that in this country numbers of contracts are considered to be public contracts in this sense, that they are solemn contracts if made under seal and delivered. I notice in Mr. Jessel's speech upon the Bankruptcy Bill, that he comments upon the absurdity of one class of creditors, with a seal upon a piece of paper, being enabled to lay hold of the whole of the property of a deceased person, to the exclusion of all creditors, or persons interested, who have pieces of paper without the same amount of wax affixed to them; but in making any alteration, if alteration is to be made, as to the respective values of specialty and other contracts, the old idea which lay at the foot of their validity must be remembered. They were considered to be public and solemn transfers of property and interests in property. This would be very well were they really so. It seems strange that the business of a notary has entirely fallen off in England, except to the one—a very important one, no doubt—of supporting and witnessing transactions as to bills of exchange. But in Spain every notary is a public officer of the law, and transactions taking place before him are public transactions, and the original and real contract made by a notarial instrument is preserved by him in his office, the parties thereto being furnished with what are called original copies. The same is the case with regard to wills. The superior effectiveness of such instruments as these has some element of reasonableness in it, but whether two persons privately making a document which has a seal upon it, and merely from that fact, without regard being had to the ancient reasons for its superior validity, is an anomaly which should no longer be allowed to exist. Public documents should be really public, and there should be some means of either registering, depositing, or in some way referring to them, as mortgages are registrable in York and in Middlesex, and as bills of sale and the change of property in shipping are also registrable.

With regard to the way in which the public monopolies were administered by the Spanish Ministers of the Crown, I can give you one example, a story told me by a gentleman who has had an interview upon the subject with a minister, whose name in connection with Her Majesty Isabella the 2nd has attracted great attention. He was Minister of Colonies. As such, he had the direction of the importation of the government monopoly of tobacco. In order to secure the reception of any kind of tobacco, it was necessary to bribe the custom-house officials, or rather the minister. He was promised for himself so much per hogshead of tobacco. The merchant sold his contract to another. He was sent for by the minister himself, and in his own bureau the latter said to him, "Remember, you have sold your contract, but your agreement with me remains; for all the tobacco that is imported under the contract made in your name with the government, you will have to pay me so much per hogshead." Of course, the merchant laughed at him; but I give this anecdote as a proof of the open, unblushing venality which characterised the late ministry of Isabella the 2nd. Gonzales Bravo, to my certain knowledge, was at one time promised five or six sums, varying from two to six thousand pounds, to assist in carrying out certain measures; and so all public matters were carried on in Spain. Let us trust that the change now sought to be made in that country may make some alteration at least in these practices. That a country which has been corrupt for 300 or 400 years will suddenly change because a lot of ragamuffins have shouted *Viva la Libertad*, and because General Serrano and General Prim have taken the places of General Narvaez and Senor Gonzales Bravo, I do not expect.

One word as to the foreign relations of Spain in her commercial capacity. With the absurd uncertainty and folly which has for so many years characterised the administration of the Spanish ports, it was hopeless to think that Spanish commerce could flourish. Quarantine is put on and taken off the ports especially Cadiz, Malaga, and the southern ports of Spain, in a way which is as foolish as it is mischievous. It is pretty clear that the regulations with regard to quarantine are principally levelled against ourselves, on account of our holding Gibraltar. Any article in the *Gibraltar Chronicle*, or any matter in which the interests of Spain and England clash, is immediately visited by the putting of quarantine upon some or all the ports of Spain, on English vessels coming from England, where, as it would appear, the most malignant disorders are constantly raging. The numberless complaints that we have made to the Spanish government upon this ground have met with the usual attention such complaints obtain when not forcibly urged and not backed by some degree of firmness.

It would be of the highest importance, if not only international law could be framed into some kind of code which would meet with the approval of all civilized nations, but that the various provisions of commercial law, and which in point of fact should only differ upon the merest matters of detail, could be assimilated and reduced to some form which should be acted upon by common consent by the various tribunals when dealing with commercial matters. England is peculiarly unfortunate with regard to the acknowledgment of her rights, for as we give so very little validity to the proceedings of foreign tribunals, so in return they profess themselves unable to understand our system, and we have very great difficulty in enforcing our rights.

Finance.

I extract the following from the "*Times*:"—

It would not be easy to describe fully and precisely, in all its details, the actual financial condition of Spain. The report which Mr. Robert Lytton has compiled, in his short official residence at Madrid, as Secretary of the British Legation, treats the subject as completely as was in his power, under the circumstances. The public income of Spain is derivable from six several sources. The revenue derivable from direct taxation was estimated by the Cabinet of the late Queen at about £7,037,800, for the present financial year ending on the 30th of June, 1869. The indirect taxes were expected to yield for the the same period about £4,788,470. The stamp duties were calculated at £8,284,090. A total of £4,257,376 was expected from the profits and sale of State property. The colonial revenue was estimated at £1,339,010, and the special resources of the Treasury at £140,000. The total estimated income for the present year, therefore, amounted to about £25,846,747. The expenditure for the same period was fixed at £26,564,787, leaving an estimated deficit of about £718,040.

Mr. Lytton gives a statement of the public debt of Spain, and, including this twenty million loan, he makes it 245 millions sterling. A more scientific adjustment of imposts, and a more liberal commercial policy, is a work for the Constituent Cortes, rather than for a Provisional Government. An extensive reform of the tariff may be expected to be vehemently opposed by the cotton manufacturers in Catalonia. Artificial protection now enables the Catalonian manufacturer to keep wages at a rate which would be ruinous if that protection were withdrawn.

Mr. Lytton gives the following statement of the expenditure proposed by the last budget for the fiscal year 1868-9. The general obligations comprise:—Civil List, £458,500; Cortes, £23,970; public debt, £6,735,583; compensations, £154,282; pensions, £1,635,305—making a total of £9,007,640. The departmental expenditure is as follows:—Office of President of the Council, £68,842; Foreign-office, £138,245; Grace and Justice, £2,110,940; War, £3,966,712; Marine, £858,544; Interior, £918,907; Public Works, £1,893,991; Finance, £4,451,609; Colonies, £151,669; and, adding the expenses on sale of national property, £3,134,186, the total becomes, £17,557,147; the grand total being £26,564,787.

Mr. Lytton maintains that the two permanent plagues of Spain are the army and the employés. The Spanish army is an admirable one, both as regards economy and efficiency; but it is either too large or too small—too small for single-handed defence, unnecessarily large for the maintenance of order at home. It is a permanent source of internal disorder. It reduction to political *impuissance* is the first condition of national regeneration and social order. Scarcely less disastrous is the multitude of persons in government employ, or pensioned off to make room for the hungry parasites of a new party in power. "This swarm of Spanish flies makes a perpetual blister applied to the public income." Half the number of employés better paid, and of a much higher calibre, would do the work better, and the result, in a higher tone of political morality, would be absolutely priceless; but how can these tasks be executed by a government borne into power on the shoulders of suborned prætorians, and with its existence representing the successful combination of three great political parties, each with its hosts of claimants for subsistence at the expense of the taxpayer? But Mr. Lytton holds that Spain unquestionably has made, and is making, progress. "The real sources of her national wealth being essentially unartificial, Spain is in the enjoyment of a physical vitality, capable of surviving social disorders and violent political experiments, which would be destructive to the more delicate foundations of any state whose prosperity, like our own, is the product of human ingenuity and patience than of fertile soils and favouring suns. In less than 20 years the value of the external commerce of this country (under a commercial system so illiberal and complex as to be almost an anachronism in Europe) has increased from 8,000,000 to more than 30,000,000. Under equal disadvantages the revenue, always elastic, has steadily increased; and, what is far more important, the Spanish race has, in the character of it, more energy and capacity for labour than either the Portuguese or the Italian. The harm done by the revolution is obvious. It may be easily reckoned in pounds, shillings, and pence. But the utmost amount of this national "bill for damages" is, perhaps, a cheap price for the good which the revolution is pledged to effect, if it can. Already the events of the 29th September are bringing to a crucial test a whole host of flimsy political common-places. They have rudely shaken the sluggish dominion of many mischievous traditions; they have stimulated those generous emotions which may be easily misguided, but in the absence of which nothing great is ever achieved; and, although they have assuredly not as yet enriched the national exchequer, they have, at least, replaced the nation itself in possession of two beneficial resources—responsibility and hope."

I have frequently alluded, in the early part of this paper, to the system of irrigation of the Moors. Irrigation is the great want of modern Spain; without it its vast tracts of land must be practicaly unproductive, and subject to the vicissitudes of a climate which, during seven or eight months of last year, gave no rain at all, and in consequence the whole of the wheat-crops, throughout two-thirds if not three-fourths of Spain, were utterly lost, even to the seed required for the next year's harvest. There was no food for the cattle, and the unfortunate cultivators were obliged to sell their mules, valued from £25 to £30 a piece, for a dollar or two dollars at the market of the neighbouring town. If the rapidly sloping torrents from the high centre of Spain were, as they well can be, intercepted by weirs and canals, carried off from the higher level across the fields, which lie skirting the precipitous banks of the river, the whole of the water of these streams can well be spared for the zone of irrigation flanking the descending current, and after fertilising the fields the residue can be allowed to flow into the river at the lower level. An enterprise of this kind is in course of completion upon two rivers in Spain by an English company. The one upon the river Henares, about five-and-twenty miles from Madrid; the other upon the river Esla, in the province of Zamora, nearer the French frontier. The author of the little book, which I hold in my hand, called "Spain in 1866," published in the series of "Odds and Ends," by Edmonston and Douglas, of Edinbro', is the engineer of these canals, Mr. George Higgin, of Madrid, whose able paper read last year at the Institution of Civil Engineers, obtained the Telford Medal. In passing, I may mention that this little sketch of Spain is worthy of an attentive perusal, being the work of an accurate and attentive observer, well acquainted with the country. If many points of resemblance are found between it and the present paper I shall be pleased, and consider that my observations are the more worthy of attention from coinciding with those of Mr. Higgin. For an abstract of the paper read before the Institution of Civil Engineers I am indebted to Mr. Forrest, the secretary.

In conclusion, and summarizing the practical suggestions to be drawn from the hurried sketch of the merits and demerits of the Peninsula, from whose laws and customs, however bad, even we may learn something; I deduce—First, That the Spaniards should abandon Cuba. Second, Disband their army as at present constituted; reconstitute it as a volunteer force by enlistment, limiting it to 25,000 men, the greater part of whom should be gens-d'armes or civil guards, acting as police, but under the law, and not under the administration, in short, not government spies, nor government jailors.

The priests are, I trust, practically weakened; let the parochial clergy marry. Let all energies be devoted to the furtherance of agriculture, by means of irrigation works, and the planting of forests. Make tramways where practicable; roads where not. The mines should be let with good titles, at fixed or progressive certain royalties for long terms, reserving dead rents to ensure working; abolishing interference, except for the protection of the miners. Do away with the conduct of trials through written documents, substituting oral testimony wherever possible. Introduce the study of the natural sciences, and make reading and writing—more easily acquired in Spain than anywhere else, from the ease of the language—compulsory. Change the whole inferior judicial staff, substituting a lesser number, to be paid judges, politically irremovable, but subject to jealous observation as to their judicial duties. Decentralization as to every matter of purely local interest, unless the Government directly aids therein. Further following out of the reforms commenced, as to the noninterference with all commercial associations, by government delegates. Carefully considered guarantees of interest upon foreign capital advanced for public works.

Permanence of public officers. A non-political executive administration will render the governmental form of less consequence, and ensure its stability.

These changes are neither violent, difficult, nor visionary. To return to my first simile, Spain is an insolvent cavalier, who is a large landed proprietor, without capital and without a banker, but with abundant securities.

I feel convinced that, with their genuine adoption, such is the wealth of Spain, such her natural internal capabilities, foreign aid and foreign science and improvement will naturally flow thither, and enable her to attain such a position among the nations of Europe as she has never before held, even in the most showy and glittering days of her military and despotic grandeur, a position, moreover, resting upon the broad basis of the happiness and prosperity of the people, instead of the deceptive and unstable glories of gloomy or profligate monarchs, haughty and intolerant priests, and ruffianly military adventurers.

DISCUSSION.

Mr. P. L. Simmonds said that although some of the topics incidentally touched upon by Mr. Underdown in his paper might, if discussed fully, trench upon debateable ground in the Society's rooms, yet they were all of the utmost importance, considered either in a political, financial, or commercial sense, to this country, and of especial interest to many who were more or less identified with Spain. Mr. Underdown had been just, even if he was severe, and the truth of many of the blots which he had pointed out in the Spanish character and the Spanish rule must be admitted. Still it should not be forgotten that the colonizing influence of Spain in olden times had extended over a large portion of South and Central America, and the descendants of Spaniards had established important states, which were thriving, and might yet become prosperous republics. The East and West Indian colonies still owned by Spain were important as regarded their produce of sugar, tobacco, and fibres. And in these and other articles produced by the Peninsula this country was interested, whether it was the wine, the waste esparto grass for paper-making, or the cochineal of the Canaries, which Mr. Underdown had alluded to. Unfortunately the latter commodity had a formidable rival in the cochineal of Mexico, and the largely employed coal-tar dyes. Whatever difference of opinion might exist as to some of the points alluded to by Mr. Underdown, there would certainly be none as to the thanks which he was entitled to for the industry and talent he had displayed in condensing and bringing forward in a popular form so large an amount of interesting information respecting a country in which Great Britain was deeply interested. It was earnestly to be hoped that a bright future might yet dawn upon that disturbed country, and that many of the improvements of irrigation, improved river navigation, honest administration, improved agricultural implements, and English capital and labour, well protected and secured, might be introduced and carried out as suggested by Mr. Underdown. Under more liberal tariffs her external commerce might increase, and the agricultural and mining interests receive more attention. Mr. Underdown had not only viewed Spain under the practical common-sense aspect of an Englishman, but a protracted residence and business affairs had enabled him to lay open with legal acumen the defects of her courts and legislation. To business men, and indeed to all members of the Society of Arts, the information he had given them was valuable, and might be carefully studied with advantage. In this sense, therefore, while he hoped there were some gentlemen present who would take part in the discussion, Mr. Underdown was entitled to their cordial thanks.

The Chairman said it was almost impossible to overrate the importance of the subjects to which his friend Mr. Underdown had referred in the paper which he had read, because undoubtedly the condition and prospects of Spain formed one of the most interesting topics of the day. Whatever difference of opinion might arise in a Society like that on the very many suggestions Mr. Underdown had ventured to bring before them, he was certain that all would agree in awarding a vote of thanks to him for the able address which he had given them, containing the results of his residence in Spain, where he was for more than two years professionally engaged. They must all agree that he had made the best use of his time in endeavouring to collect such materials as would enable him to enlighten the people of this country on those points which, as Mr. Simmonds had remarked, they had but very little knowledge of. He almost regretted that Mr. Underdown, who had shown himself so well acquainted with the wants, grievances, and capabilities of Spain, had not been at the head of the revolution, so that he might have directed its progress to the best possible results. The Chairman concluded by moving a vote of thanks to Mr. Underdown for his excellent paper.

The motion having been passed unanimously,

Mr. Underdown said he was very grateful to his audience, not only for the compliment they had just paid him, but for the attention with which his paper had been received. He had certainly thought that he had thrown down a sufficient number of bones of contention to almost ensure a quarrel over some of them, but as this had not been the case, there was little for him to reply to. There certainly had been one suggestion as to a chemical preparation being substituted for the animal dye which was procured from the cochineal insect, but this was not a very exciting topic, and he feared it would be impossible to raise a discussion upon it. He could only say that when such a substitute was found the result must be infallible ruin to the Canary Islands; and, therefore, as he had some acquaintance with the inhabitants of those islands, notwithstanding his anxiety for the prosperity of all English manufactures, he hoped they would be left in possession of their means of livelihood.

Mr. ARTURO DE MARCOARTU writes as follows:—"Few countries unite in themselves such favourable national conditions as Spain for the production of wealth, while few others, holding a lower position in civilised Europe, have found themselves more obstructed in latter times by the system ill-denominated *protective* of national work, and by the intolerant policy of the Spanish governments. The extent of the Spanish territory is 507,036 square kilometres. Its projecting position, and the fact of its being surrounded by the Atlantic and by the Mediterranean, the two seas most frequented by modern commerce, must make it the natural depôt for the trade between Europe, South America, and Africa, whenever Spain may declare herself in favour of commercial liberty. As the Peninsula is traversed by various Cordilleras from E. to W., its soil embodies a surprising diversity of climates, and in a few hours of railway travelling you may pass from a cold climate to a hot one. The cordilleras which give rise to these diversities in temperature and in production give birth also to great sources of water, available to industry, whilst underneath the hills, which are clothed by the vine or the olive, lie hidden deposits of coal, iron, lead, silver, zinc, copper, quicksilver, and other minerals. The people who inhabit this privileged region of the earth, a people energetic, enterprising, who in centuries gone by, through their courage and through their skill in navigation, obtained the primary glory of past civilisation, carrying their language and their activity into the furthermost confines of the globe, has fallen into decadence during the last few centuries, under the domineering effect of the clerical influence which made vassals of their monarchs. In these latter times, notwithstanding the warfare which the fallen dynasty waged against the spirit of philosophy, and against all manifestations of liberty, both political, religious and commercial, Spain has been strenuously working towards regaining her former position. It was the constituent Cortes of 1854 which decreed the plurality of banks, and the abolition of a fixed value upon money, measures which at that time had not yet been adopted by more populous and tranquil nations of Europe, and which created the net-work of railways which now cover the land. Since that time the attention of foreign speculators has begun to be attracted by the immense and various productions which Spain can offer when governed by liberal institutions. The abundance and fine quality of her wheat, her wines, her oil, and her fruit, bid fair to make her the grand centre of production for these articles for the United Kingdom. Spain is one of the European nations whose wealth in sheep is the most considerable, and her wool-markets are well known in England, being capable of much enlargement and improvement. With good reason, and from the remotest times, has the Iberian Peninsula been reputed very rich in minerals. Out of the forty-nine provinces of Spain two only, that of Valladolid and of the Canary Islands, have given no signs of minerals. Allowing the fact that all revolutions, as was also the case with the great popular movements of Rome and Greece in the times of antiquity, showed amongst the numerous classes rather a political than economic bearing, it affords me great gratification to state that the Spanish revolution, although yet struggling against two dynasties, and against the influence of the clergy, is preparing its economic development. I have reason to hope that, in accordance with my solicitations, all the prohibitions contained in the Custom-house tariff will disappear, and that the maximum of duties will be from 25 to 30 per cent. The restrictive and embarrassing laws which have ruled in the custom-houses, at the consulates, and in Spanish ports, account for the fact that the commerce of Spain is not commensurate with the extent of its territory, with the favouring natural conditions which it possesses for the production of wealth, and with the number of its inhabitants. Hence it happens that the freights between English and Spanish ports come to be, in most instances, higher than between England and the United States. France and England are the countries which support the greatest trade with Spain; and if we compare the trade carried on between England, Spain, Portugal, and Gibraltar, we must then make allowance for the contraband dealings which the two latter foster in Spain; and again, if we institute a similar comparison as regards the republics of La Plata, we must also materially take into our estimate the great attractions which, even in such distant countries, are presented to commerce by liberal tariffs. In point of fact, the export trade of England was in 1868 to Spain, £2,403,545; to Portugal, £1,723,270; to Gibraltar, £705,627; that is to say, that Portugal and Gibraltar show between them a consumption as considerable as that of Spain, whose extent and population is four times that of the two combined. Yet, notwithstanding such economic obstacles as the external trade of Spain has to contend against, it is an undeniable fact that it is acquiring a notable development. In the space of fifteen years it has increased more than 200 per cent. It is unquestionable that the wines of Spain would supersede all other foreign wines, to the advantage of the less wealthy classes of the English people, were the duty rated at 1s. per gallon as on the French wines; and if, as should be the case according to sound economic principles, a free admission of wines should be permitted, the most necessitous class in the United Kingdom would find in the Spanish wines their cheapest and most wholesome drink. When we come to consider, as regards mutual relations, the respective political, economic, and commercial interests of England and of Spain, the conclusion is arrived at that great advantages would be derived from drawing together the two peoples, as nations, and as exponents of industry. If governments, and if industrial incapacity do not do violence to the natural laws of exchange, Spain could furnish wheat, wool, meat, textile fabrics, oil, wine, fruit, lead, silver, and quicksilver to the English, receiving from the latter in return coal, manufactured metals, chemical products, and textures. This desirable result would, in my opinion, be forwarded by the formation of an Anglo-Spanish association, a species of free customs parliament, tending to draw together the interests of both countries. In order that financial intercourse should become developed between the English and Spaniards, it also becomes necessary to clear up definitely and *bonâ fide*, without any delay, all those claims which, whether rightly or wrongly, are constantly interfering upon the Stock Exchange between English capital and Spanish enterprise, to the great detriment of both. Moreover, in order that the commercial relations between England and Spain may attain to the importance to which they ought to arrive in the face of 47,000,000 of producers and consumers, it further becomes essential that the rates of postage should be lowered; that England should give in her adherence to the Monetary Convention of Europe; that a certain portion of the produce of Spain should be declared to be free of duty, and the duties upon other portions should be reduced to a minimum scale. And on the other hand it is likewise necessary that Spain should avert from her commerce the embarrassments occasioned at the present time by the lengthy and complicated formalities attendant upon consular clearances and quarantine regulations; that the prohibitions attaching at present to certain articles be removed; that those articles which constitute raw materials, if applicable to the industry of Spain, be declared free of duty, and that the duties upon other goods be reduced by a revision of the monstrous tariff now in force in Spain."

METEOROLOGICAL OBSERVATORY AT PARIS.

The plateau of Montsouris, on the southern extremity of Paris, beyond the University quarter, is now being converted from a barren waste into a beautiful pleasure garden, and on it has been reconstructed the palace of the Bey of Tunis, which formed one of the most attractive objects in the Champs de Mars during the exhibition of 1867. The building is now nearly completed, and the exterior looks much as it did in 1867, but, the basement especially, has been constructed in a much more solid manner than it was previously. The building is not to be dedicated in future to curiosity, but, on the contrary, to the purposes of a most important new scientific establishment, namely, an observatory for meteorological and other physical phenomena, for which the altitude of the spot and the consequent clearness of its atmosphere peculiarly fit it.

The Minister of Public Instruction, in December last, appointed a commission to draw up a complete plan for the new establishment, including the observations that should be made there, the number of persons that would be required for its proper working, a list of the instruments which would be wanted, with an approximate estimate of the expenses. The commission has performed a portion of its labour, and, amongst other things, has made a special report on the application of aërostation to the study of atmospheric phenomena; this report, not yet published, contains an account of the various scientific aëronautical experiments carried out in France, and particularly those of Mr. Glaisher in England.

A meteorological department was formed at the Paris Observatory in 1855, in consequence of the immense amount of communications received relative to the great storm which occurred in the Black Sea in November of the previous year, and correspondence exchanged with England and other countries, as well as with the whole sea-board of France. It had, however, become evident that a separate establishment would be more serviceable to the progress of physical observation, and the city of Paris undertook to furnish the site for the building. The ground devoted to the purpose on the plateau of Montsouris is about two and a-half miles in extent.

The first observations are to include a careful study of all the elements which together make up the climate of Paris and the basin in which it is situated, and of all the interesting physical terrestrial phenomena which are there produced; a general examination and calculation of ancient observations, a work, says M. Camille Flammarion, which England, Prussia, and Austria have also undertaken on their own account; a similar examination and record of all the observations made in France or abroad, and communicated to the new observatory; a regular publication of the results produced by these labours, whether valuable for the higher purposes of science, or for the practical results to be derived from them. Meteorological science is at present in an unformed condition, and the establishment of such an observatory cannot fail to aid in the collection of facts, as well as in the gradual evolution of the laws which lie within the phenomena in question.

DISTRICT SCHOOLS FOR PAUPER CHILDREN.

By George C. T. Bartley, Esq.

II.—THE SOUTH METROPOLITAN DISTRICT SCHOOL, SUTTON, SURREY.

In continuing the investigation of the cost of these district schools, from the last number of the *Journal*, the Sutton school may next be considered. This institution rivals that at Hanwell, having, in 1867, no less than 1,177 children within its walls.

The following returns are taken from the annual report for the year ending Lady-day, 1867, which was the most recent obtainable on application. The details of expenditure are not given so fully as those in the annual report of the school at Hanwell, and it is to be regretted that the returns from all these district schools are not made uniformly, and in the fullest manner possible:—

I.—Cost of Officers and Servants.

Description of officer.	Salary.			Estimated cost of rations.			Total.			Cost per head for each child at the school.
1.—General Staff.	£	s.	d	£	s.	d.	£	s.	d.	£
Superintendent	100	0	0	†						
Chaplain	150	0	0							
Clerk	150	0	0							
Matron	60	0	0	†						
Superintendent's clerk	104	0	0							
Porter and wife	35	0	0	†						
Pantry maid	12	0	0	†						
Cook	20	0	0	†						
Officers' cook	14	0	0	†						
Housemaid	12	0	0	†						
Hall maid	12	0	0	†						
Store-room maid	12	0	0	†						
Labour superintendent	104	0	0							
Kitchen maid	10	0	0	†						
Infirmary cook	15	0	0	†						
Stoker	46	16	0							
	856	16	0	312	0	0	1,168	16	0	·993
2.—Nurses.										
Girls' and infants' nurse.	16	0	0	†						
Assistant do.	12	0	0	†						
Boys' do.	14	0	0	†						
Two for girls.	24	0	0	†						
Four for boys	48	0	0	†						
Head infant nurse	15	0	0	†						
Four infant nurses	52	0	0	†						
Three assistant nurses in infirmary	32	0	0	†						
	213	0	0	442	0	0	655	0	0	·556
3.—Medical.										
One medical officer.	130	0	0							
	130	0	0				130	0	0	·110
4.—Teachers.										
Head boys.	110	0	0	†						
Second do.	60	0	0	†						
Six assistants	16	5	0	†						
Mistress (infants)	40	0	0	†						
Second do. (do.)	36	0	0	†						
Master (girls' school)	85	0	0	†						
Mistress (do.)	40	0	0	†						
Six assistants	16	5	0	†						
	403	10	0	468	0	0	871	10	0	·740
5.—Industrial and other Instructors.										
Bandmaster	50	0	0							
Drill master	40	0	0	†						
Do. mistress	18	0	0	†						
Three needle mistresses.	60	0	0	†						
Laundress	18	0	0	†						
Laundry maid	12	0	0	†						
Five laundry women	195	0	0							
Bedmaker	15	0	0	†						
Baker	46	16	0							
Assistant.	41	12	0							
Carpenter	85	16	0							
Painter	78	0	0							
Assistant	70	4	0							
Tailor.	65	0	0							
Three assistants	156	0	0							
Shoemaker	65	0	0							
Two assistants.	104	0	0							
Engineer	70	4	0							
Bricklayer	85	16	0							
Assistant	54	12	0							
	1,331	0	0	208	0	0	1,539	0	0	1·307
6.—Farm Servants, &c.										
Bailiff.	65	0	0							
Two labourers.	88	8	0							
One cowman.	45	10	0							
One ploughman	52	0	0							
One labourer	54	12	0							
	305	10	0				305	10	0	·259
Grand total	3,239	16	0	1,430	0	0	4,669	16	0	3·967

† Those marked thus (†) receive rations which have been estimated at 10s. a week each person.

II.—The Cost of Maintenance.

The various details under this head are placed under the one general heading in the annual statement of accounts as "provisions and necessaries." Adding to this half the cost of the coals which must be required in preparing the food, which item is divided in the Hanwell school accounts, makes a total of £7,243 16s. 3d. From this must be taken the estimated cost of the officers' rations, already stated, leaving £5,815 16s. 3d. This is at the rate of £4·941 per head per annum.

III.—The Cost of Clothing.

This item in these schools appears rather higher than at the Hanwell school, but it includes "bedding," which is probably included in the latter institution in a large item called "linen drapery, upholstery, &c." The amount, then, for clothing and bedding is £2,287 9s. 4d., or at the rate of £1·943 per head per annum.

IV.—Miscellaneous Expenses.

Under this heading are included the various expenses of the institution, including a large item of £603 8s. 9d. for outfits of children on leaving the school for service or apprenticeship, and expenses of conveying them to their places of destination. The whole amount is £3,005, being at the rate of £2·553 per head.

V.—Farm Expenses.

The cost of this amounts to £754 9s., being at the rate of £0·640 per head per annum.

VI.—Rent and Re-payment of Cost of Building.

The amount borrowed for the erection of the school was £49,100, of this £27,230 has been repaid, leaving a sum of £21,870 still outstanding. On this, as interest and repayment of a portion of capital, a sum of £3,532 0s. 5d. was expended. In addition, an exceptional outlay of £1,553 13s. 8d. was this year made for payment on account of contract for erection of infirmary, and being added to the above gives £5,085 14s. 1d. This unusual charge swelling this item from £3 to £4·32 per head per annum must, therefore, be remembered in comparing the average cost with other institutions.

The general summary of these schools gives an average cost considerably below that of the Hanwell establishment, and in the staff a remarkable difference exists, as may be seen by the following :—

	Sutton.		Hanwell.
1. Staff..................	£3·967	..	£8·144
2. Maintenance	4·941	..	9·500
3. Clothing	1·943	..	1·870
4. Miscellaneous..........	2·553	..	4·637
5. Farm	·640	..	1·012
6. Rent and redemption of buildings............	4·320	..	5·675
Total	18·364	..	30·838

or, leaving out the exceptional cost of the infirmary buildings at Sutton, this gives an annual cost of £17 against over £30 at Hanwell.

Fine Arts.

◆

Election of Fine Art Exhibition Juries in Paris.—The election of the juries for the admission of works of art to the *salon* this year, and for the award of the medals, has recently taken place, under the conditions laid down four or five years since, namely, that each artist who had sent in a work for exhibition, and had had one received at a previous *salon*, although he had not obtained a medal, had the right to vote for two-thirds of the members of the jury of his own section of art. About eight hundred artists voted, and the following are the names of the jurors elected:—In the section of painting and drawing — MM. Gérôme, Baudry, Pils, Bonnat, Bida, Gleyre, Fromentin, Comte, Breton, Daubigny, Robert H. Fleury, and Cabanel; in sculpture and die-sinking – MM. Barye, Guillaume, Perraud, Soitoux, Dumont, Dubois, Cabet, and Carpeaux; in architecture—MM. Duc, Labrousse, Duban, Vaudoyer, Viollet Le Duc, and Ballu; in engraving and lithography— MM. Lalanne, Mouilleron, Jacquemart, Boetzel, Gaucherel, Henriquel-Dupont. The list is nearly the same as last year's; in painting the name of one successful young painter, M. Bonnat, is added in addition to M. Comte, who acted as a juror last year in consequence of the retirement of an artist above him on the list; in sculpture the only new name is M. Paul Dubois, who received the grand medal of honour for his beautiful statue of the young Florentine playing the lute; while in architecture two of the names not in last year's list are those of members of the Institute, while the third is an artist who won the Grand Prix de Rome twenty-nine years ago. It is evident that the artists generally differ but little with the authorities, for of the twenty-six members comprising the three juries just referred to, more than half are members of the Institute and professors. The engravers and lithographers alone have elected one of their body who has not received any academic or other distinctions, but who is a well-known illustrator. The number of works sent in for exhibition this year is larger than ever, amounting in all to 6,375, of which 5,570 belong to the section of painting and drawing.

The Louvre.—Visitors to Paris this year will find a collection of about three hundred pictures of the Dutch and Flemish schools, which have not been seen for three or four years, in consequence of the rebuilding of that portion of the great gallery which adjoins the palace of the Tuileries. The collection is placed in what was, the other day, the Salle des Etats, but which was used for the last time by the Emperor, at the meeting of the legislative corps at the opening of the present session. The gaudy decorations of the room have, happily, been hidden by screens placed in front of the columns which support the galleries on each side, on which the pictures are hung. The new Salle des Etats, which is attached to the Tuileries, is now being decorated, twelve allegorical figures having just arrived to be placed on the Corinthian pilasters of the hall. Two additional rooms have been opened in the Louvre on the lower floor, near the new entrance to the galleries; they contain a collection of monumental and other sculpture of the later Roman period, reproductions of the magnificent tombs of the dukes of Burgundy in the Dijon Museum, and of some Flemish antiquities.

Tungstate of Barytes as a White Pigment.—The tungstate of barytes is said to have been in use in France, as a substitute for white lead, or white zinc, for some months with success. It has been employed for oil and water-colour painting and chromo-lithography.

Copyright Convention between France and Belgium.—A declaration has recently been issued with the view of simplifying the formalities necessary for the security of copyright in works of literature and art in France and Belgium reciprocally. In future, in order that the natives of either country may obtain justice in the courts of the other State, nothing in future will be required but the production of a certificate emanating from the proper authority, showing that the work in question is original, and enjoying, in the country of the artist, legal protection against piracy or illicit reproduction. In the case of works published in France, this certificate will be delivered from the bureau of literature in the Ministry of the Interior, and legalised at the Belgian legation in Paris. In the case of works published in Belgium, the necessary certificate is to be delivered also by the Minister of the Interior, and legalised by the French legation at Brussels. This simple method of verification is to have the same duration as the International Copyright Convention of 1861, to which it is annexed.

Commerce.

Commerce of Rio Janeiro.—In 1864, 985 ships, of an aggregate burden of 342,753 tons, entered this important harbour; in 1865 the total rose to 1,063 ships, of 387,151 aggregate tonnage; in 1866, to 1,223, of 430,883; and, in 1867, 1,250, of 477,350 tons. As regards the points from which these ships came, Platean ports occupy the first rank. Then, in the order of their importance, come Liverpool, Cardiff, Newcastle, New York, London, the Cape de Verd Islands, Lisbon, Havre, Baltimore, Hamburg, Oporto, Marseilles, Bordeaux, Trieste, Glasgow, Cette, and Southampton. The United States furnished the largest number of agricultural implements imported to Rio in 1867, but French agricultural machinery begins, nevertheless, to be employed in the Brazils. As regards industrial machinery in use in the Brazils, England supplies nearly the whole of it, with the exception of that which is employed in the sugar manufacture, and which is especially supplied by the French mechanical firms.

Commerce of Switzerland.—In 1868 the imports to Switzerland were 114,222 head of small cattle, such as sheep, goats, pigs, &c., 161,366 head of horned cattle, and 3,965 horses and mules. The value of the imports of articles such as mill-stones, tools, implements, carts, and railway waggons, which paid duty in proportion to their value, amounted to 938,696 francs. The number of loads of goods brought into Switzerland was 644,679, of which 89,875 were loads of timber for building, fire-wood, &c., and 386,154 loads of charcoal, coal, coke, &c. Besides this there were imported 9,335,991 quintals of merchandise of various kinds, amongst which 3,680,959 quintals of cereals, 232,309 of flour, 37,995 of butter and lard, 44,101 beer in barrels, 175,057 coffee, 50,552 chicory, 11,658 paper and cardboard, 20,030 clock and watch-work, 252,799 sugar, 37,038 tobacco, 333,407 oil, 943,437 wine in barrels, and 8,703 wine in bottles. During the same period the exports amounted to 60,386 head of small cattle, 66,626 head of horned cattle, and 1,669 horses and mules. Timber of the value of 7,467,262 francs, and charcoal of 335,254 francs; 78,013 loads of various merchandise, of which 14,008 loads of fresh fruit, potatoes, and other vegetables; 20,666 loads of bricks, tiles, and stone for building purposes, and 1,438,929 quintals of various goods, amongst which 15,741 quintals of butter, 226,588 of cotton goods, 5,569 of absinthe and kirschwasser, 283,737 of cheese, 66,098 machines or parts of machines, 18,522 of silk, 57,310 raw hides, 3,733 clocks and watch-work, and 21,671 paper and cardboard. In transit *via* Switzerland there were 115,051 head of cattle, 27,088 loads of timber, and 1,915,316 quintals of general merchandise.

Free Carriage of Italian Samples to the East.—The owners of the Italian mail steam packets, Messrs. Rubaltino and Co., of Genoa, who last July established a line of steamers between that port and Alexandria, have just given notice to the various Chambers of Commerce throughout Italy, that, with a view of extending the commerce of that country in the East, they are prepared to take samples gratis, of Italian manufacture or produce on their steamers to Alexandria, to the extent of 20 tons each voyage. The cases or packages of samples must not exceed 50 kils. in weight, or 2 cubic feet in capacity each.

Colonies.

The Drought in Victoria.—The drought has been so severe that deep waterholes and reservoirs that never failed before have been dry this year, and farmers and settlers who usually have no difficulty in this way, have been obliged to cart water for themselves and their stock for many miles. Feed having utterly failed in many places too, owners of small lots of cattle and sheep have been obliged to drive them to market and sell them for what they would fetch, or drive them away to the better watered districts and pay for their keep. Those who could not afford to take the latter course had to drive them to the ranges where rough feed is to be had, but with the prospect of not being able to recover half of them when feed becomes plentiful again at their homes. On a larger scale sheep have been given away, half the number to be returned in three or four months, and many flocks in the interior are said to have died of actual starvation. Several hundreds of thousands have been started on their travels to crawl about the country in search of food and water, which had totally failed on the stations of their owners, and only a small percentage of these can survive. The great scarcity of water in the interior is proved by the fact that the herds of wild horses have become an easy prey to the settler, when in ordinary years nothing can be done with them.

Notes.

French Railways.—On the 31st December, 1868, the total length of the French railways was 16,191 kilos., of which 15,856 kilos. were worked during the year. The total receipts amounted to 664,968,043 francs, as compared with 659,017,446 francs in 1867, but this last corresponds with a length of 15,044 kilos. The receipts per kilo. in 1867, were 43,806 francs as compared with 41,938 francs in 1868. The greatest decrease in the receipts was in the old network, being 65,605 francs per kilo. in 1867, against 63,324 francs in 1868; a slight increase was made on the new network, being 21,209 francs per kilo. in 1868, against 21,099 francs of the previous year. The receipts on the secondary lines decreased from 17,249 francs per kilo. in 1867, to 16,576 francs in 1868. The third quarter of the year was the most important as regards amounts taken; the next in importance being the fourth, second, and first quarter. The tax paid to government on "transports à grande vitesse," was 33,043,774 francs in 1867, against 31,131,710 francs in 1868.

The Havre Maritime Exhibition.—We are requested to state that the Diplomas of Honour, Gold and other medals, and Certificates of Honourable Mention, awarded to British exhibitors by the international jury at the Havre Maritime Exhibition, can now be obtained on application to Messrs. J. M. Johnson and Sons, of Castle-street, Holborn, the Commissioners for the United Kingdom.

Correspondence.

The Theory of Boiling.—Sir,—The question put to Mr. Tomlinson on Wednesday evening, the 7th inst., as to how the various nuclei or porous subtances, which he so ably described and presented to our view, acted in causing an increased quantity of distillate (or, in other words, improved the evaporative power of the boiler or still in which they were inserted), was not to my mind answered satisfactorily by his subsequent explanation; but, as the hour was late, I forbore addressing the meeting upon the subject. With your permission, however, I would desire, in the form of this letter, to say a few words upon the subject. Mr. Tomlinson described their action, as I understood him, to be as follows:—Taking, as an example, a piece of charcoal, as one of the most powerful of the nuclei, he represented that, owing to its extreme porosity, it presented an enormous extent of surface to the boiling liquid, "a piece of it no larger than one's thumb nail presenting a surface of no less than several square yards;" and when this surface came in contact with a liquid supersaturated with its own vapour, as he very aptly described a boiling liquid to be, it alternately absorbed and discharged the liquid and the vapour; each of its innumerable pores, in fact, drawing in and expelling the supersaturated liquid in such a manner as to liberate large quantities of vapour. Such was the scope of his explanation, but, as I have before remarked, it is, to my mind, incomplete, a link in the chain being wanting. That link I now propose to supply. The question is, in what consists the evaporative power of nuclei (porous substances) inserted in a boiling liquid? And I would add the following question as a corollary to it, What is the cause of the "bumping" of boiling water in a vessel when nuclei are not present? A right solution of these questions must be of the utmost importance to every one concerned in the useful arts. In reply thereto I beg to state at once, clearly and distinctly, that I am convinced the action of nuclei is due principally and almost wholly to a current or circulation of the boiling liquid wich is caused by their presence. To explain this, let us consider for a moment what the process of boiling really is. Heat—as we term it—is conducted through a plate, that is, it is poured into it on one side, in much the same way as water is poured into a bed of sand, and speedily reappears at the other, next to the liquid about to be boiled. But the moment it comes in contact with the liquid, it (the liquid) is converted into vapour; and so far the process is popularly understood. But there is another stage of it which is very important, and necessary to the completion of the process, but which has not hitherto received that attention (possibly on account of its not been seen, except through a glass vessel) which it deserves. It is the disengagement of the vapour from the heated plate and from the surrounding water which presses upon it. When the water in a boiler is at rest—that is, when there is no current or circulation of the water in it, the bubbles of vapour are very small, and rise with difficulty from the places where they are formed. But when there is a current, however gentle, the bubbles of vapour aggregate and increase in size, and rise in quick succession to the water's surface. And what is the effect of their so rising? Fresh supplies of water are more quickly allowed to come in contact with the heated plate, to be converted in their turn into further supplies of vapour; so that the greater the circulation of the water in a boiler, the greater is the evaporation. Nuclei, or porous substances, undoubtedly attract and expel a boiling liquid in the manner described by Mr. Tomlinson, but they do not of themselves directly increase the evaporative power of a still or boiler; it is not owing to any occult power in them as half explained by Mr. Tomlinson, neither is it owing to the subtle influence of electricity, as suggested by one speaker, that such a result is obtained by their use; but it is simply owing, I assert fearlessly, to their indirect influence in causing motion, and therefore a current in the water, which allows, or rather stimulates, the bubbles of vapour to aggregate and arise quickly from the heated plate. This matter of a current in boiling water is pregnant with results of the utmost importance in regard to the future construction of steam boilers and of boiling apparatus generally. Having during the last three years made numerous and costly experiments upon the subject, I feel entitled to speak with some authority upon it, and could here very greatly enlarge, but I fear that I have already encroached upon your space. Suffice it to say that a circulation of the liquid in a boiler is the chief thing to increase its evaporative power, whether that circulation be caused by nuclei or by any other means. The matter of the "bumping" of boiling water in a vessel when nuclei are not present is, as I have found, entirely referable to the want of a current, or circulation. Once establish a current and the "bumping" ceases. The reason is, when there is no current the vapour arises at long intervals (comparatively speaking), and in large masses, and therefore with a violent action and re-action; but with a current it is continually being taken away in small bubbles. Mr. Tomlinson claimed, at the close of his paper, the merit of the discovery of the fact that it is owing to the presence of nuclei that a great discharge of vapour from a super-saturated liquid is made; I claim the solution of the problem as to how these nuclei really act, and to having given the key-note to all real improvement in steam-boilers and boiling apparatus generally, an improvement which can easily double their power (I am within the mark) and save in fuel thousands of pounds annually to the great manufacturing interests of this country.—I am, &c., JOHN C. WILSON, Memb. Inst. Mech. Eng.

26, Martin's-lane, Cannon-street, E.C., 8th April, 1869.

MEETINGS FOR THE ENSUING WEEK.

MON......Society of Arts, 8. Cantor Lecture. Mr. John Anderson, C.E., "On Applied Mechanics."
Society of Engineers, 7½. Mr. F. W. Hartley, "On the Methods employed in the Determination of the Commercial Value and Purity of Coal Gas."
Social Science Assoc, 8. Law Amendment Society. Mr. T. E. Holland, "On the Necessity and Practicability of Improving the Form in which the Statute Law is promulgated."
Medical, 8.
British Architects, 8.
Asiatic, 3.
Victoria Inst., 8.
TUES ...Royal Inst., 3. Prof. Grant, "On Stellar Astronomy."
Statistical, 8. Dr. Guy, "On Insanity and Crime, and on the Plea of Insanity in Criminal Cases."
Pathological, 8.
Anthropological, 8.
Civil Engineers, 8. 1. Adjourned discussion upon Mr. Kirkham's paper, "Standards of Comparison for Testing the Illuminating Power of Coal Gas;" and (time permitting) 2. Mr. Wm. Shelford, "On the Outfall of the River Humber."
WED ...Society of Arts, 8. Mr. Wybrow Robertson, "On Trade Marks."
Meteorological, 7.
R. Society of Literature, 4½. Annual Meeting.
THUR ...London Inst., 6.
Royal, 8½.
Zoological, 4 and 8½.
Royal Society Club, 6.
Royal Inst., 3. Prof. Tyndall, "On Light."
Society of Fine Arts, 8. Exhibition of Engravings. A paper by Mr. Saddler.
FRI ......Antiquaries, 2. Annual Meeting.
Royal Inst., 8. Mr. E. B. Tylor, "On the Survival of Savage Thought in Modern Civilisation."
Quekett Club, 8.
SAT ......Royal Inst., 3. Mr. A. Geikie, "On the Origin of Land Surfaces."

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Par. Numb. *Delivered on 3rd April*, 1869.
62. Bill—Regulation of Railways Act (1868) Amendment.
111. East India (Council)—Return.

Delivered on 5th April, 1869.
64. (III.) Committee of Selection—Fourth Report.
107. Election Petitions—Return.
108. Election Petitions—Return.
109. Civil Services Estimate "On Account."

Delivered on 6th April, 1869.
52. Bill—Turnpike Roads.
62. „ Railway Companies' Meetings (corrected copy).
99. Printed Books—Accounts.
105. "Atlantic" Pilot Cutter—Correspondence.
110. Mail Contracts (United States)—Letter.
116. Post-office (West India Mails)—Returns.
119. Mail Steamers (Cunard and Inman Lines)—Return.
117. Maynooth College—Return.

Delivered on 7th April, 1869.
100. Light Dues—Report from the Trinity House to the Board of Trade.
Public Petitions—Tenth Report.

Delivered on 8th April, 1869.
64. (IV.) Committee of Selection—Fifth Report.
128. Soldier Labour (Aldershot, &c.)—Reports.
129. Barrack Services (Portsmouth, &c.)—Return.
Manufactures, Commerce, &c.—Embassy and Legation Reports (No. 2, 1869).

Delivered on 9th April, 1869.
79. Public Bills (Ireland and Scotland)—Return.
80. Civil Services and Revenue Departments—Appropriation Accounts (1867-8).

103. Clerks (Somerset House)—Order in Council.
132. Immigrants and Liberated Africans—Return.
Ordnance Survey and Topographical Depôt—Report.
Science and Art Department (Ireland)—Report of the Commissioners, Vol. I.

Delivered on 10*th April*, 1869.

67. Bill—Sunday and Ragged Schools.
60. Army (1867-8)—Statement of the Savings and Deficiencies.
81. (I.) Railway and Canal Bills—Second Report.
109. Civil Services—Estimate ("On Account") (corrected copy).
131. Greenwich Hospital—Estimate.
133. Army (China and Japan)—Correspondence.
Public Petitions—Eleventh Report.

Patents.

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From Commissioners of Patents' Journal, April 9.

Grants of Provisional Protection.

Aërated beverages, &c., apparatus for containing, treating, &c.—847—J. Hamilton and R. Paterson.
Ammunition, supplying to troops under action—821—T. Martin.
Animal and vegetable substances, preserving—978—R. Jones.
Baking powders—924—G. Dymond.
Bobbins—918—T. Sowden and J. Newton.
Boilers—954—A. Barclay.
Boilers, injecting water into—861—J. Loader.
Boots and shoes—966—T. Greenwood and J. Keats.
Boxes for holding matches, &c.—923—W. E. Gedge.
Brick and tile pressing machines—975—B., H., and J. N. Craven.
Buckets, &c.—930—D. Jones.
Cages or hoists, safety apparatus applicable to—913—J. T. Calow.
Carding engines—963—B. Dobson and J. Eastham.
Carriages, &c.—962—A. Chambers.
Carts, &c.—974—T. Corbett.
Cement kilns, &c.—945—W. P. Hope.
Chairs—873—J. E. Emerson.
Chimneys—909—T. Champion.
Cigars—972—W. Langer.
Coal, &c., excavating—906—F. Hurd.
Copper and bismuth, separating from ores containing metals—969—G. Wells.
Earth closets and urinals—967—A. F. Baird.
Electro-magnetic machines—917—W. R. Lake.
Envelopes—973—B. J. B. Mills.
Fire-arms—897—A. Clayton and J. Riley.
Fire-arms, breech-loading—839—C. G. Bonehill.
Fire-arms, breech-loading—929—H. Haschke.
Fire-arms, breech-loading—984—H. Carter and G. H. Edwards.
Fire-arms, breech-loading, cramp keys for—992—W. Gibson.
Fire-arms, &c.—825—J. H. Johnson.
Fire-arms, &c., breech-loading—938—G. Bloem and E. Scheidt.
Fire bars—877—R. Gregson.
Fire escapes—911—T. Baker.
Flooring cramps—879—C. Longfield.
Flooring cramps—901—J. Woodhead.
Fly wheels—833—J. Ritchie.
Furnaces for the manufacture of glass—959—T. G. Webb.
Garden and fire engines—890—R. W. Page.
Gas burners—831—W. T. Sugg.
Greenhouses, &c.—928—N. Voice.
Hats—990—T. Higgins.
Hay-tedding machines—859—W. R. Lake.
Horse shoes—922—H. Downie and I. B. Harris.
Hydrocarbon oils, distilling—956—T. E. Williams.
Iron and steel—905—J. J. Bodmer.
Iron and steel—908—J. H. Johnson.
Land-tilling machinery—912—W. C. Dreyer.
Lawn-mowing machines—964—F. W. Follows and J. Bate.
Lime kilns, &c.—960—H. Y. D. Scott.
Liquids, cooling—920—A. C. Kirk.
Locomotive engines—931—F. Parker.
Locomotive engines and railway carriages—837—F. W. Fox.
Locomotive engines, utilising the waste steam of—965—T. A. Dillon.
Locomotive engines, &c.—889—J. B. Fell.
Looms—823—J. C. Ramsden.
Looms—926—G. Hodgson, H. Bottomley, and E. Cockroft.
Match splints, &c.—887—F. de Bowens.
Metal, engraving and chasing articles of—981—T. Lippiatt.
Metals, coating—942—E. Morewood.
Motive-power—787—E. Sands.
Motive-power engines—857—H. E. Newton.
Mules for spinning—899—C. B. Parkinson, A. and J. Metcalf, and W. H. Heald.
Musical boxes—932—J. Jaquillard.
Music, apparatus used in producing surfaces for printing—3840—W. H. Lennox and J. W. and W. J. Pearman.
Muzzles for dogs, &c.—925—L. Hannart.
Numerical counting machines—937—F. B. Taylor.
Ordnance, side arm for clearing the chambers and rifling of—910—J. T. Greenfield.
Ordnance, working—896—W. E. Newton.
Paints, &c., rubbing and mixing—875—A. Clark.
Paper-making machines, wire cloth for—988—J. B. Rowcliffe.
Paper pulp—811—J. J. G. Damitte, J. M. Agnellet, and H. D. Dubois.
Pencil cases—948—J. Bath.
Photographic printing, producing negatives for—853—J. V. Robinson.
Picks and railways for cutting coal, &c.—943—S. Firth.
Pipe and tube joints—914—C. Marsden.
Presses for applying combined eylets and paper fasteners, &c.—892—C. McDermott.
Railway breaks—986—J. Beckett and A. W. Field.
Railway carriages, &c., heating by means of electricity—888—M. F. Maury.
Railway point and signal levers—900—F. Baker.
Railways—952—M. McLeod.
Railways—958—F. Render.
Railways—976—J. Livesey.
Screw propellers—867—H. Vansittart.
Semolina, &c., machinery for manufacturing—927—J. J. Bagshawe.
Sewing machine tables—957—W. F. Proctor.
Sewing machines—898—T. Shakespear and G. Illston.
Sewing machines—936—W. Riddell and T. Bletcher.
Sewing machines—946—G. T. Bousfield.
Sewing machines, &c., obtaining motive-power for—843—A. V. Newton.
Ships, constructing and treating, to correct and prevent compass deviations—934—J. W. Girdlestone.
Shuttles—865—W. Crossley and J. W. Swithenbank.
Soda and potash—939—W. R. Lake.
Steam-engine indicators—977—J. A. Hopkinson & J. Hopkinson, jun.
Steam engines—829—S., A., and S. Haycraft.
Steam engines, marine—994—W. Allan.
Steering apparatus—835—E. A. Inglefield.
Stereoscopes—944—A. Clark.
Sulphuric acid—881—L. A. Israel.
Telegraph poles, &c., tubular—635—F. N. Gisborne and H. Allman.
Threads, balling or winding—953—C. E. Brooman.
Vegetable substances, &c., extracting oleaginous matter from—933—B. J. B. Mills.
Velocipedes—950—W. W. Harris.
Velocipedes—951—A. Muir.
Waggons for carrying coal, &c.—907—J. R. Baillie.
Weighing scales—841—E. T. Hughes.
Wind instruments, mouthpiece of—855—J. Kay.
Window sashes—916—W. Meakin.
Window sashes and blinds—895—J. Nevill.
Wire fences—968—R. Johnson.

Inventions with Complete Specifications Filed.

Boot and shoe heels and tips, revolving—989—C. D. Norton.
Boilers, &c., materials for preventing the escape of heat from the surfaces of—1011—J. Howden.
Coal and grain boat elevators—1004—S. K. Hoxsie.
Fire arms, breech-loading—1017—F. Boyd.

Patents Sealed.

3118. F. W. Hart.
3119. N. Smith.
3124. S. Leoni.
3125. A. Field and A. W. Tuer.
3126. W. Brailsford & J. Gadsby.
3128. T. F. Cashin.
3130. H. C. Clifton.
3133. W. T. Sugg.
3134. R. Dawson.
3136. J. Worster.
3140. J. Shanks.
3147. E. Leach.
3153. C. G. Gumpel.
3155. H. A. Bonneville.
3188. J. Cockshoot, jun., and H. Weatherill.
3159. E. Peyton.
3196. W. Fitch.
3199. J. Elce.
3203. G. Chapman.
3280. A. M. Clark.
3304. J. G. Tongue.
3309. W. H. Liddell.
3326. A. M. Clark.
3491. W. R. Lake.
3422. R. Halliday.
3536. W. R. Lake.
3650. A. Ransome.
3811. C. E. Brooman.
3981. F. A. K. W. Von Oppen.
370. W. R. Lake.
386. W. R. Lake.

From Commissioners of Patents' Journal, April 13.

Patents Sealed.

3145. J. G. Jones.
3152. J. Denly.
3160. T. Gray.
3162. R. M. Wood.
3164. W. R. Lake.
3170. R. Head.
3173. C. Churchill.
3175. A. Denayrouze.
3177. E. T. Hughes.
3178. C. Mayer.
3179. D. Wilson.
3184. F. P. Warren.
3185. R. A. Green.
3200. J. A. Farrar and B. R. Huntley.
3210. J. F. Brinjes.
3243. J. Gregson and W. Monk.
3248. I. Baggs.
3251. B. Hunt.
3286. J. B. O'Hea and W. Bullen.
3363. A. L. Bricknell.
3377. M. A. F. Mennons.
3379. W. Broughton.
3472. J. H. Johnson.
3574. H. E. Newton.
175. W. R. Lake.
235. H. W. and R. Lafferty.
402. B. F. Sturtevant.
403. J. H. Johnson.
456. A. Morton.
531. M. Gray.
556. R. P. Williams.
639. J. Howe, jun.

Patents on which the Stamp Duty of £50 has been paid.

1019. R. Leake, W. Shields, and J. Beckett.
641. J. Tansley.
1031. G. A. Ermen.
1041. J. J. Bodmer.

Patents on which the Stamp Duty of £100 has been Paid.

974. J. Colling.
1028. G. D. Mertens.
1032. J. Petrie, jun.
1124. G. T. Bousfield.
1218. A. C. Kirk.